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Research Article

Revision of the Western Cape endemic genus *Stegopterus* Burmeister & Schaum, 1840 (Coleoptera, Scarabaeidae, Cetoniinae, Trichiini)

Enrico Ricchiardi[1], Renzo Perissinotto[2], Werner Strümpher[3]

1 *Corso A. Tassoni 79/4, 10143, Turin, Italy*
2 *Institute for Coastal & Marine Research (CMR), Nelson Mandela University, Gqeberha 6031, South Africa*
3 *Ditsong National Museum of Natural History, PO Box 413, Pretoria 0001, South Africa*
Corresponding author: Werner Strümpher (strumpher@ditsong.org.za)

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Abstract

Stegopterus Burmeister & Schaum, 1840 is a Trichiini genus endemic to the Western Cape Province of South Africa. Until now, it has been regarded as comprising only four species, namely *S. vittatus* (Fabricius, 1775), *S. suturalis* (Gory & Percheron, 1833), *S. septus* Burmeister & Schaum, 1840 and *S. obesus* Burmeister, 1842. Our study of historical specimens housed in museums and private collections, along with new specimens collected recently, has revealed that there are at least 15 species in this genus of which 11 are new, with *S. obesus* relegated to *incertae sedis* (see updated species list below). What is most interesting is that the genus has radiated within a rather restricted region, between the South and West coasts and the Cape Fold Mountains (CFM). This reflects a typical Fynbos distribution, similar to that already described for other insect groups. On the basis of synapomorphy, *Stegopterus* has now been subdivided into two species groups, namely "*vittatus*" and "*septus*." In this work, 11 new species are described, diagnosed and illustrated, and their geographic distributions are mapped: *Stegopterus agulhas* **sp. nov.**, *S. cochraneae* **sp. nov.**, *S. endroedyi* **sp. nov.**, *S. fuscus* **sp. nov.**, *S. hexrivieri* **sp. nov.**, *S. kromrivieri* **sp. nov.**, *S. lamellus* **sp. nov.**, *S. langebergicus* **sp. nov.**, *S. pallidulus* **sp. nov.**, *S. paardebergi* **sp. nov.**, *S. rotundiceps* **sp. nov**. A key for accurately identifying species of *Stegopterus* is provided. Lectotypes are designated for the following species: *S. septus* Burmeister & Schaum, 1840, *Trichius suturalis* Gory & Percheron, 1833 (now *S. suturalis*) and *Cetonia vittata* Fabricius, 1775 (now *S. vittatus*).

Key words: Afrotropical Realm, Cape Floral Region, diagnostic key, montane relics, new species, South Africa

Introduction

The genus *Stegopterus* was originally erected by Burmeister and Schaum (1840) to include three South African species: *S. vittatus* (Fabricius, 1775), *S. suturalis* (Gory & Percheron, 1833) and *S. septus* Burmeister & Schaum, 1840. In their description of the new genus, Burmeister and Schaum (1840) neither defined a type species nor indicated the type series for the three species. Previously, Gory & Percheron (1833, pp. 83–84, pl. 9 figs 5, 6) had delineated *Cetonia vittata* Fabricius, 1775 and *Trichius suturalis* (mispelled as "saturalis") Gory & Percheron,

1833, based on an unknown number of specimens in the “cabinet des auteurs”, now partially available in the Melly Collection (currently housed in the MNHG) and labelled as “Gory Types”. The third species, *S. septus*, is represented by a male, also preserved in the Melly Collection, and labelled as “Schaum Type.”

Cetonia vittata Fabricius, 1775 was described as being collected in “Habitat in Cap. B. Sp.” [Cap bon. Spei.; Cape of Good Hope, South Africa] and reposited in the J. Banks Collection “Mus. Banks.” The collection is currently housed in the Natural History Museum, London, UK (NHMUK). There is only one male specimen belonging to *Stegopterus* without a label identifying it as the type of *C. vittatus*. The specimen could not be accurately identified to species level because it has been extensively glued, making it risky to soak it in distilled water to extract and examine its parameres. Additionally, both antennae are missing. Burmeister (1842, p. 746) described *S. obesus* Burmeister, 1842 based on a single female from "Port Natal" [Durban, KwaZulu-Natal (KZN), South Africa]. Unfortunately, it is not possible to designate a type for this species because the specimen used in the original description cannot be traced. The few key characters specified by Burmeister (1842) seem to indicate that a *Stegopterus* may indeed have been involved, but these are not sufficient to include *S. obesus* in this revision. Furthermore, this species was not even mentioned by Péringuey (1907) in his revision of the *Stegopterus* species and must, therefore, be treated as *incertae sedis*. The locality reported on its label is outside of the known range for the genus, and subsequent searches for this species within KZN have led to the conclusion that it is most unlikely that *Stegopterus* may have reached that province of South Africa. All the currently known species are restricted to the Fynbos and marginal Karoo areas of the Western Cape Province (WCP), not even reaching the Eastern Cape Province (ECP) (see distribution map, Fig. 21).

In 1907, Péringuey reviewed the South African Trichiini and redescribed the genus *Stegopterus*, introducing a new species, *S. natalensis* Péringuey, 1907, in addition to the three previously known species. However, this new species did not belong to the genus *Stegopterus* and was later reassigned to the genus *Eriopeltastes* Burmeister & Schaum, 1840, by Ricchiardi in 1997 (p. 122). During the same revision, Péringuey designated *Stegopterus lugubris*, which he had described in 1888 (p. 105), as the type species for his new monospecific genus, *Xiphoscelidus* (Péringuey, 1907, pp. 320–321) (now *Brachagenius lugubris*, see Evans (1987)). Although Péringuey mistakenly classified *S. natalensis* within the genus *Stegopterus*, his description of the genus (Péringuey 1907, pp. 296–297) remains valid. A dichotomous key for the South African genera of Trichiina can be found in Ricchiardi et al. (2017, pp. 131–132). In this work, we have chosen to adopt the tribal classification of Trichiini, following the recent recommendation by Allsopp et al. (2024, p. 65). Finally, Smith (2004; 2005) subsequently designated *Trichius suturalis* Gory & Percheron, 1833, as the type species of the genus *Stegopterus*.

Successive studies of the mostly male specimens preserved in South African museums and private collections have revealed that the genus *Stegopterus*, previously thought to consist of only three species, is in fact, a complex of species nested between the South and West coasts and the Cape Fold Mountains of the WCP. With the addition of the species described below, the genus now comprises fourteen verified species and one of *incertae sedis*, eleven of which are new. This work presents the results of the analysis of all available specimens with the aim of providing a modern revision of the genus and stimulating further collections/observations, to achieve a better understanding of its diversity and radiation patterns.

Materials and methods

In this study, specimen total length was measured between the apex of the pygidium and the anterior margin of the clypeus. The specimen width is the maximum elytral width.

For the identification of males, the dichotomous key (see below) should be used in combination with the full description of the HT and then confirmed with an analysis of the shape of the aedeagal parameres. As the parameres are conservative within the genus, they should be examined within a broader suite of characters rather than in isolation in order to adequately distinguish between the various species.

Some of the main characters used in the key require clarification, as follows.

1) Clypeus: Shape of the anterior corner and lateral margins (Fig. 1).
2) Elytra: Presence-absence and shape of a broad intrahumeral black band.
3) Mesotibia: Shape in males (Fig. 2).
4) Antennal clubs: Length relative to the clypeus (Fig. 3).

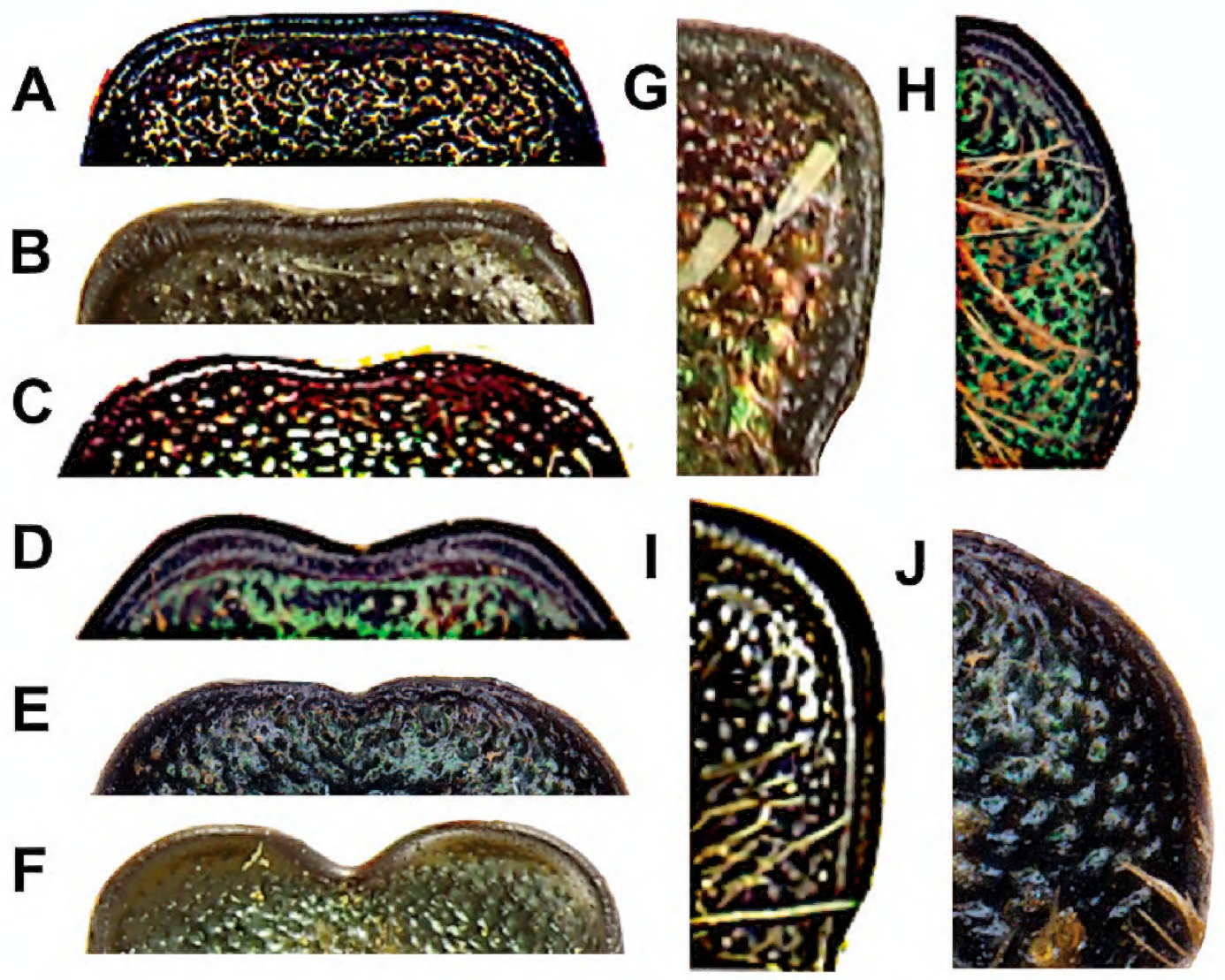

Figure 1. Shapes of male clypeal margins in *Stegopterus* spp. **A–F**, anterior margin; **G–J** lateral margin. **A** straight (e.g. *S. pallidulus* sp. nov.) **B** broadly and very shallowly retuse **C, D** simply retuse (e.g. *S. cochraneae* sp. nov., *S. vittatus*) **E** emarginate **F** deeply emarginate (e.g. *S. endroedyi* sp. nov.) **G** anterior corner shortly rounded (about 33% of clypeus length), lateral margin mildly reborded and narrowing towards base (e.g. S. *paardebergi* sp. nov.) **H** corner rounded (about 40–55% of clypeus length), lateral margin mildly reborded and narrowing towards apex (e.g. *S. vittatus*) **I** anterior corner rounded (about 40–55% of clypeus length), lateral margin strongly reborded and slightly narrowing towards base (e.g. *S. hexrivieri* sp. nov.) **J** anterior corner rounded (about 40–55% of clypeus length, lateral margin faintly reborded and semicircular (e.g. *S. septus*).

Figure 2. Shape of *Stegopterus* male mesotibia. *S. septus* **A** simply convex. *S. vittatus* **B** strongly bent ventrally with apex modified.

Concerning the last character, often in the description of Trichiini a comparison is made between the length of the club (flagellum) and the footstalk (scape and segments combined). The footstalk enables the adult beetle to bend the club in various directions in order to perform its sensory function. However, because of this flexibility, the footstalk is rarely perfectly straight, making accurate length measurements difficult.

Most photographs of the specimens were taken by WS with a Canon EOS 5D camera fitted with a Canon 100 mm macro lens. The male genitalia were imaged under a Zeiss Axio Zoom V16 microscope fitted with a digital camera (at ×16 magnification). All stacking was done using Helicon Focus 8 software and GIMP 2.10.38 for minor edits. Alternative photographs were taken by ER with a Nikon Coolpix P7700 attached to one of the eyepieces of a Wild dissecting microscope. Backgrounds were removed using GIMP 2.10.38 (www.gimp.org) to increase contrast. Individual photographs were finally merged to generate composite images using Zerene stacker 1.04 Build version T2023-06-11-1120 software. The distribution maps were created using QGIS version 3.16.9-Hannover, based on the label data from each examined specimen.

Museum and private collections abbreviations are as follows:

ERPC Enrico Ricchiardi Private Collection, Turin, Italy.
LACM Natural History Museum of Los Angeles County, Los Angeles, United States.
MNHG Musée d'Histoire Naturelle, Geneve, Switzerland.

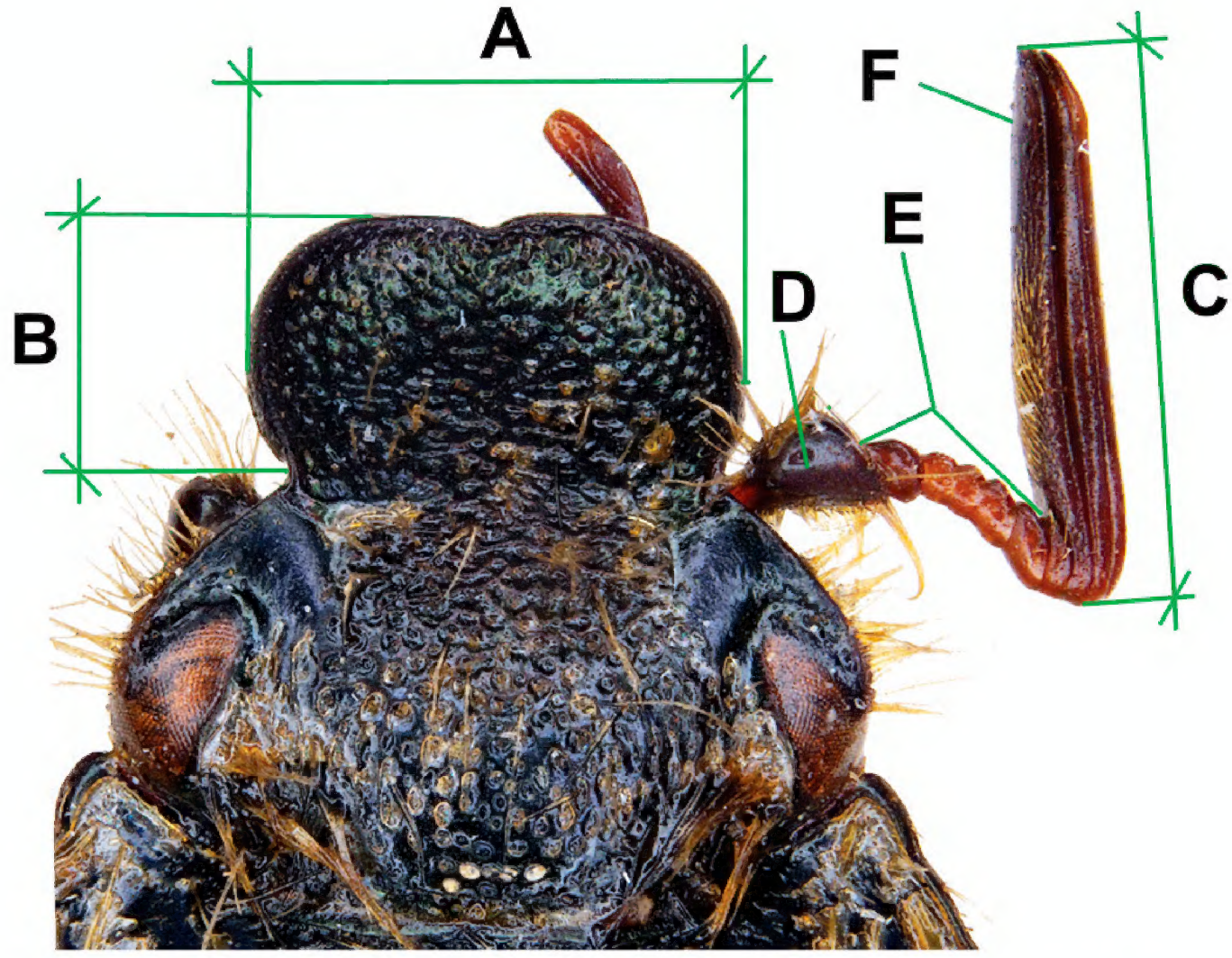

Figure 3. Head measurements. *Stegopterus septus* **A** clypeus maximum width **B** clypeus lateral length **C** club length **D** scapus **E** pedicel. Photograph: Guido Sabatinelli.

MNHN	Muséum National d'Histoire Naturelle, Paris, France.
NHMUK	Natural History Museum, London, United Kingdom.
RPRM	Renzo Perissinotto Research Material, Gqeberha, South Africa.
SAMC	Iziko South African Museum, Cape Town, South Africa.
SANC	South African National Collection, Pretoria, South Africa.
TMSA	Ditsong National Museum of Natural History, Pretoria, South Africa.

Geographical abbreviations: ECP, Eastern Cape Province; KZN, KwaZulu-Natal Province; WCP, Western Cape Province.

Results

Taxonomy

Stegopterus Burmeister & Schaum, 1840

Stegopterus Burmeister & Schaum, 1840: 404 (as *Trichius* (*Stegopterus*)). Type species *Trichius suturalis* Gory & Percheron, 1833: 48 (by subsequent designation of Smith 2004: 288; Smith 2005: 75, 76). Placed on the Official List of Generic Names in Zoology (International Commission on Zoological Nomenclature 2006).

Stegopterus: Schaum 1844: 348; Lacordaire 1856: 562; Harold 1869: 1342 (revised status); Péringuey 1907: 296; Schenkling 1922: 14; Schein 1960: 112; Krikken 1984: 40; Krajčik 1999: 49; Ricchiardi 2000: 205; Ricchiardi 2015: 3; Ricchiardi 2017: 132; Smith 2004: 288; Smith 2005: 76 (protected name); Allsopp and Schoolmeesters 2024: 67.

Tetrophthalmi Kirby, 1827: 156; Burmeister and Schaum 1840: 404; Smith 2004: 287; Smith 2005: 75, 76.

Tetrophthalmus Kirby, 1827: 156, as *Trichius* (*Tetrophthalmi*) (synonym of *Stegopterus*): Smith 2004: 278; Smith 2005: 75, 76. Type species of *Tetrophthalmus* is *Trichius sutularis* Kirby, 1827 by monotypy. Placed on the Official Index of Rejected and Invalid Generic Names in Zoology (International Commission on Zoological Nomenclature 2006).

Diagnosis. The males and females of *Stegopterus* can be distinguished at first glance from other South African Trichiini by their appearance and the following set of characters: ***General appearance*.** Abdominal tergites are covered by elytra in dorsal view, with only the pygidial apex visible. Elytra elongate. Pronotal length is less than 0.5 times that of the elytra length. Clypeus broader than long. The front and vertex of the head, pronotum, and sometimes the inner margins of the elytron and lower sides are covered with thick, long, inclined, testaceous setae pointing backwards. ***Head*.** Antennal club is longer in males than females and as long as or much longer than clypeus. Eye-canthus covers approximately three-quarters of the semi-circumference of the eye. ***Pronotum*.** Slightly broader than long, more attenuated anteriorly than posteriorly, and with basal angles clearly defined. Posterior corners of pronotum acute. ***Scutellum*.** Cordiform, as broad as long. ***Legs*.** Long; tarsi longer than tibiae, strongly spinose underneath; protibia bi-dentate on lateral margin in males, tri-dentate in the females with the lower spurs of the hind tarsus clearly compressed and blunted at the tip. Protarsi claws 0.7–0.9 times as long as proximal protarsus. ***Mesotibia*.** In males, it is either strongly bent inward and the apex widened (species group *vittatus*, see the key below) or weakly curved with the apex not strongly modified (species group *septus*). ***Metatibia*.** Widened distally, without projections, with two distal spurs. First metatarsal segment equal to or slightly shorter than the second. ***Metafemora*.** Slender (maximum width less than 0.25 times its length).

***Stegopterus agulhas* sp. nov.**

https://zoobank.org/8EFCB6B4-FDB8-4092-936E-5CA51D9D20C5

Figs 4, 5

Type material. ***Holotype*:** South Africa – WCP • ♂; Agulhas N.P. Bergplaas; 26 Sep. 2006; R. Perissinotto & L. Clennell leg.; TMSA.

***Paratypes*:** South Africa – WCP • 1 ♂; same data as for holotype; ERPC • 2 ♂ same data but 27 Sep. 2006; RPRM.

Diagnosis. *Stegopterus agulhas* sp. nov. differs from *S. endroedyi* sp. nov., the closest species, by having the lateral margin of its clypeus reborded and narrowing towards the apex, the pygidium surface imbricate and the protibia externally tridentate, with the distal two teeth closer to each other than to the third (see dichotomous key below). The shape of its parameres is also distinctive (Fig. 4F, G).

Description. Male (holotype). ***Measurements*.** Total length = 15.2 mm; maximum width = 7.7 mm. ***Body*.** Stocky, with melolonthinoid shape, black, with some metallic hue; elytra dark testaceous, with anteapical humbones blackish and prominent, with a large sutural/juxtascutellar black band, with violet hue,

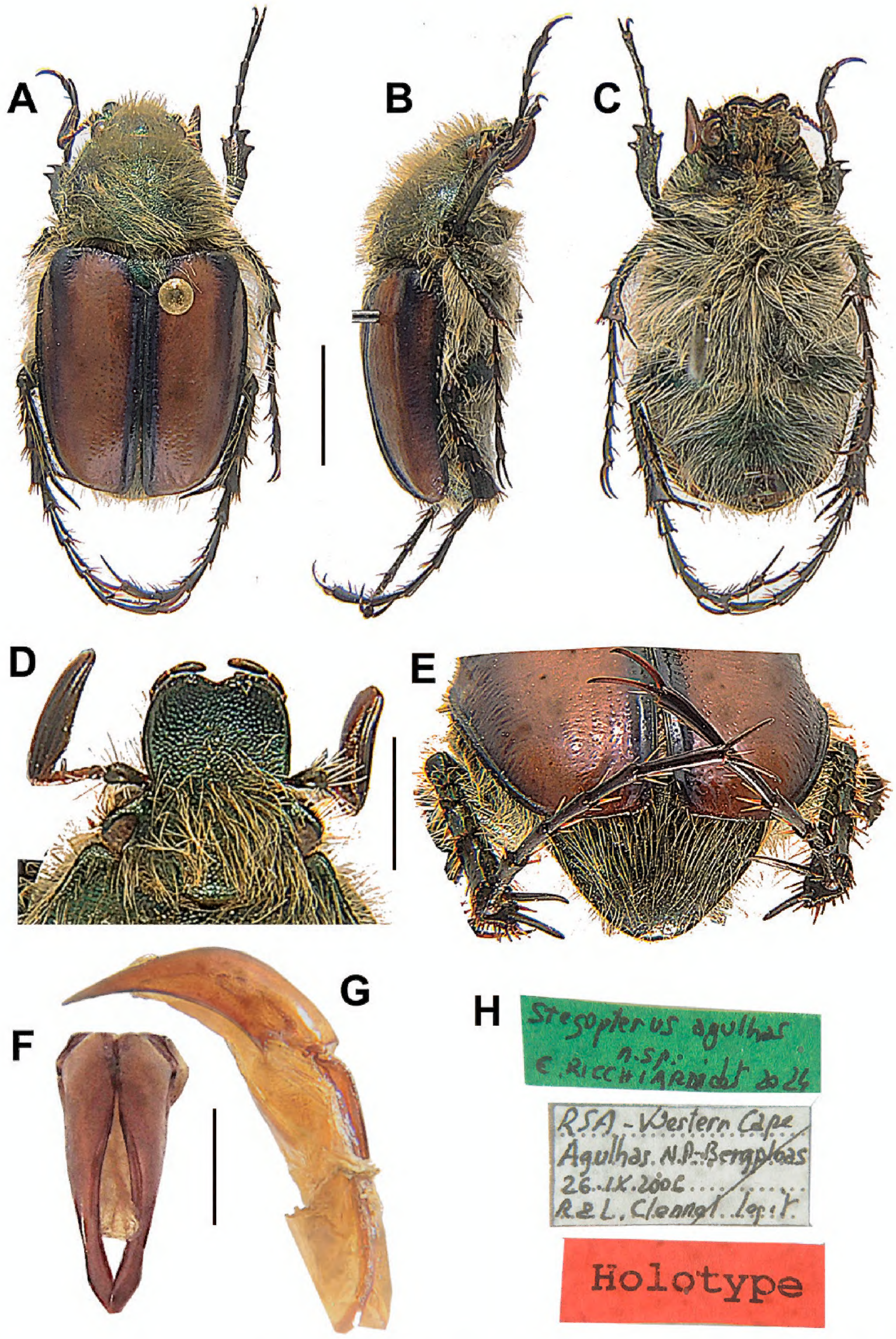

Figure 4. *Stegopterus agulhas* sp. nov., holotype ♂ TMSA **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head **E** pygidium **F** parameres, frontal view **G** parameres, lateral view **H** labels. Photographs: E. R. Scale bars: 2 mm (**A–C**); 2 mm (**D, E**); 1 mm (**F, G**).

not reaching posterior margin; all other elytral margins narrowly black except posterior; antennae brownish; legs black with coppery metallic hue. ***Head.*** Clypeus wider than long, mostly glabrous, with few scattered, long testaceous setae posteriorly; surface covered with thick, rounded punctures, somewhat

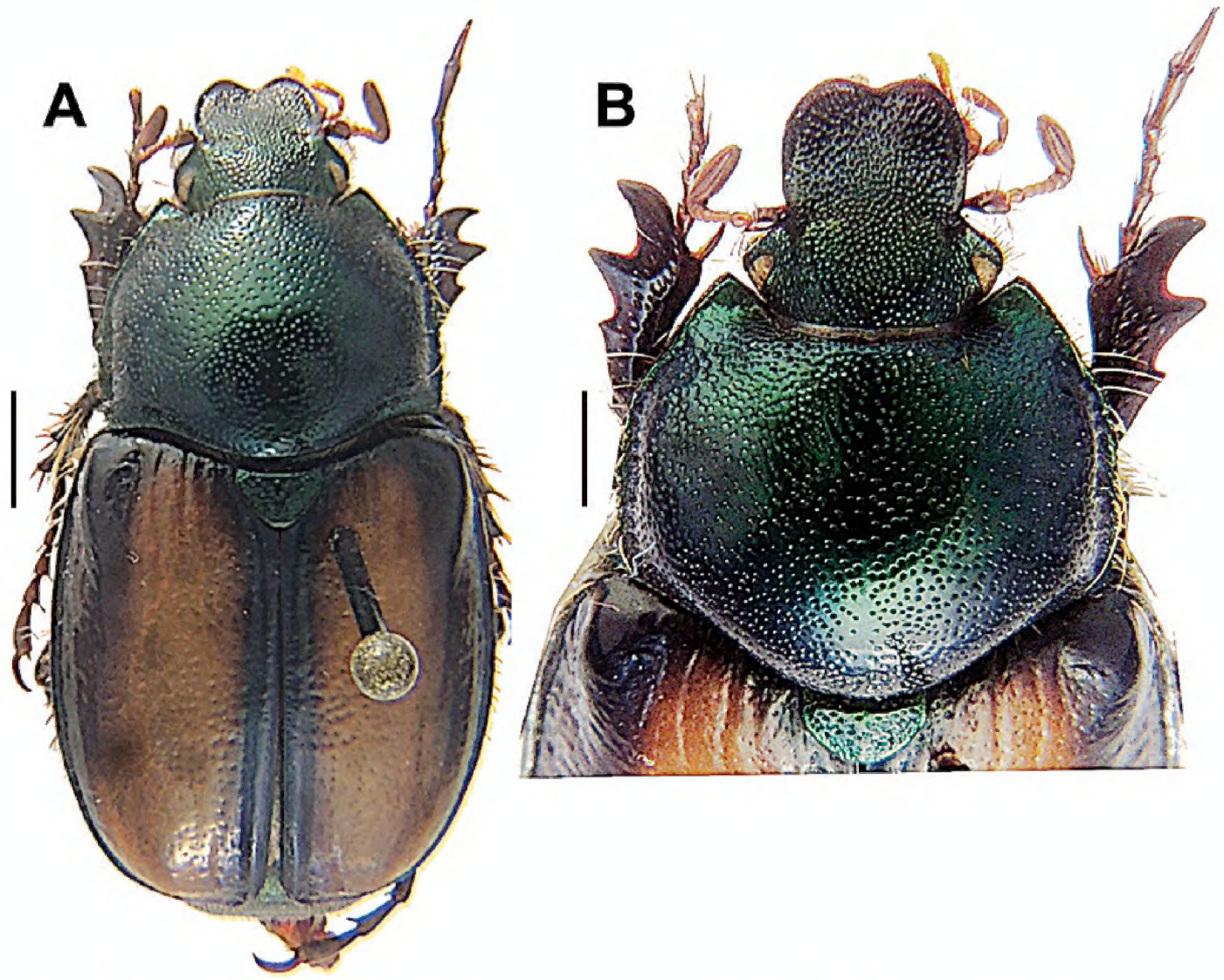

Figure 5. *Stegopterus agulhas* sp. nov., paratype ♀ ERPC **A** dorsal habitus **B** pronotum and head. Photographs: E. R. Scale bars: 2 mm (**A**); 1 mm (**B**).

confluent at sides; anterior margin retuse, anterior corners rounded, lateral margin mildly reborded and tapering towards apex (Fig. 4D); antennal club arched, 1.3 times longer than clypeal length. ***Pronotum*.** Wider than long; surface with round, deep, dense punctures, confluent or imbricate at sides and covered with thick, long, testaceous setae. ***Scutellum*.** Covered with dense, round punctures, imbricate at centre and anterior margin. ***Elytra*.** Posterior margin shagreened; discal striae effaced, entire surface covered with scattered, rounded punctures, lateral declivity shagreened. ***Pygidium*.** Wider than long, surface imbricate and covered with scattered, very long, testaceous setae. ***Legs*.** Protibia externally tridentate, distal teeth closer to each other than to third; mesotibia strongly bent ventrally, with upper spur on apex slightly curved and lower one about 30% shorter; second metatarsal segment as long as first (Fig. 4C). ***Venter*.** Black with green metallic hue; abdomen covered with large, round punctures, locally imbricate, and very long, backward bent setae (Fig. 4C).

Paratype ♀ (differences from ♂ only). Measurements: total length = 15.2 mm; maximum width = 7.6 mm. Body stockier than in male, with same green metallic hue. Pronotum and scutellum glabrous and shiny. Antennal club shorter than clypeal length (about 0.7 times). Protibia wider than in male, tridentate, with all teeth equally spaced (Fig. 5).

Type series variability. The other males of the type series are very similar to each other and to the holotype, with no significant differences in shape or colour patterns.

Etymology. The species is named after the locality where the type series was collected. Noun in apposition.

Distribution. This new species is currently known from a single locality within the borders of the Agulhas National Park (Fig. 21). It is most likely that it

occurs across the entire Cape Agulhas region, which encompasses the southernmost tip of the African continent.

Remarks. Specimens were found feeding on flowers of *Berzelia* sp., *Leucadendron* sp.and *Leoucospermum* sp.

***Stegopterus cochraneae* sp. nov.**

https://zoobank.org/A8BCE007-D500-44C9-906C-DDB5FF48D121

Fig. 6

Type material. ***Holotype*.** South Africa – WCP • ♂; Zuur Vlakte, Wellington; 3000 ft [~900 m]; Nov. 1922; R. Lawrence leg.; SAMC: SAM-COL-A040047.

***Paratypes*.** South Africa – WCP • 31 ♂; SW Cape Prov., Hawequas Mt; 33.40S, 19.05E [33°40'S, 19°05'E]; E-Y 1519; 1350 m; 4 Dec. 1978; Endrödy-Younga leg.; grassnetting; TMSA • 1 ♂; same data as for preceding; MNHM • 1 ♂; Franschhoek; E.P. Phillips leg.; 1913; ERPC • 2 ♂ same data as for preceding; SAMC: SAM-COL-A040048 a and b • 1 ♂; Du Toits Peak, Huguenot; 6000' [ft] [~1800 m]; SAMC: SAM COL-A040049 • 3 ♂; Dutoits Kloof; 1350 m; 5 Nov. 1976; N.J. Duke leg.; TMSA • 1 ♂; same data as for preceding; ERPC • 1 ♂; Dutoitskloof Pass; 28 Dec. 2017; R. Perissinotto & Lynette Clennell leg.; RPRM.

Diagnosis. *Stegopterus cochraneae* sp. nov. differs from *S. pallidulus* sp. nov. by having the clypeal lateral margin reborded and narrowing towards apex and the metatibial lower spur much shorter than the upper (see dichotomous key below). The shape of its parameres is also very distinctive (Fig. 6F, G).

Description. Male (holotype). ***Measurements*.** Total length = 13.6 mm; maximum width = 6.9 mm. ***Body*.** Stocky, with melolonthinoid shape, black, with some green metallic hue, partially orange-brown antennae, elytra and legs orange-brown; elytra bordered by broad black band fading towards apical margin; second black band joining external basal corner to anteapical humbone also present. ***Head*.** Vertex covered with testaceous, very long, dense setae, bent backwards; clypeus wider than long (2.1 times), glabrous, deeply hollowed, broad and covered with thick, round punctures; anterior margin slightly retuse, anterior corners rounded, lateral margins mildly reborded and narrowing towards apex (Fig. 6D); antennal club curved, about 1.35 times clypeal length. ***Pronotum*.** Wider than long, with maximum width at base; black with predominant green metallic hue; surface imbricate and covered with thick, long, testaceous setae. ***Scutellum*.** Black, covered by dense, round punctures. ***Elytra*.** Dark brown-orange, semi-transparent with apicosutural corner rounded and humeral humbones prominent; posterior border shagreened; discal striae visible and exhibiting large punctures; lateral declivity horizontally shagreened. ***Pygidium*.** Wider than long, black with predominant green metallic hue; surface imbricate and covered with long, testaceous, flattened setae. ***Legs*.** Protibia externally tridentate, with distal two teeth closer to each other than to third and apical tooth rounded; mesotibia strongly bent ventrally, with the upper spur long and straight, lower spur about 30% shorter than upper spur; apex of mesotibia with twelve prominent, reddish, regularly spaced setae; second metatarsal segment as long as first. ***Venter*.** Abdomen black, with green metallic hue, covered with large, round punctures, locally imbricate and with very long, backwards flattened setae.

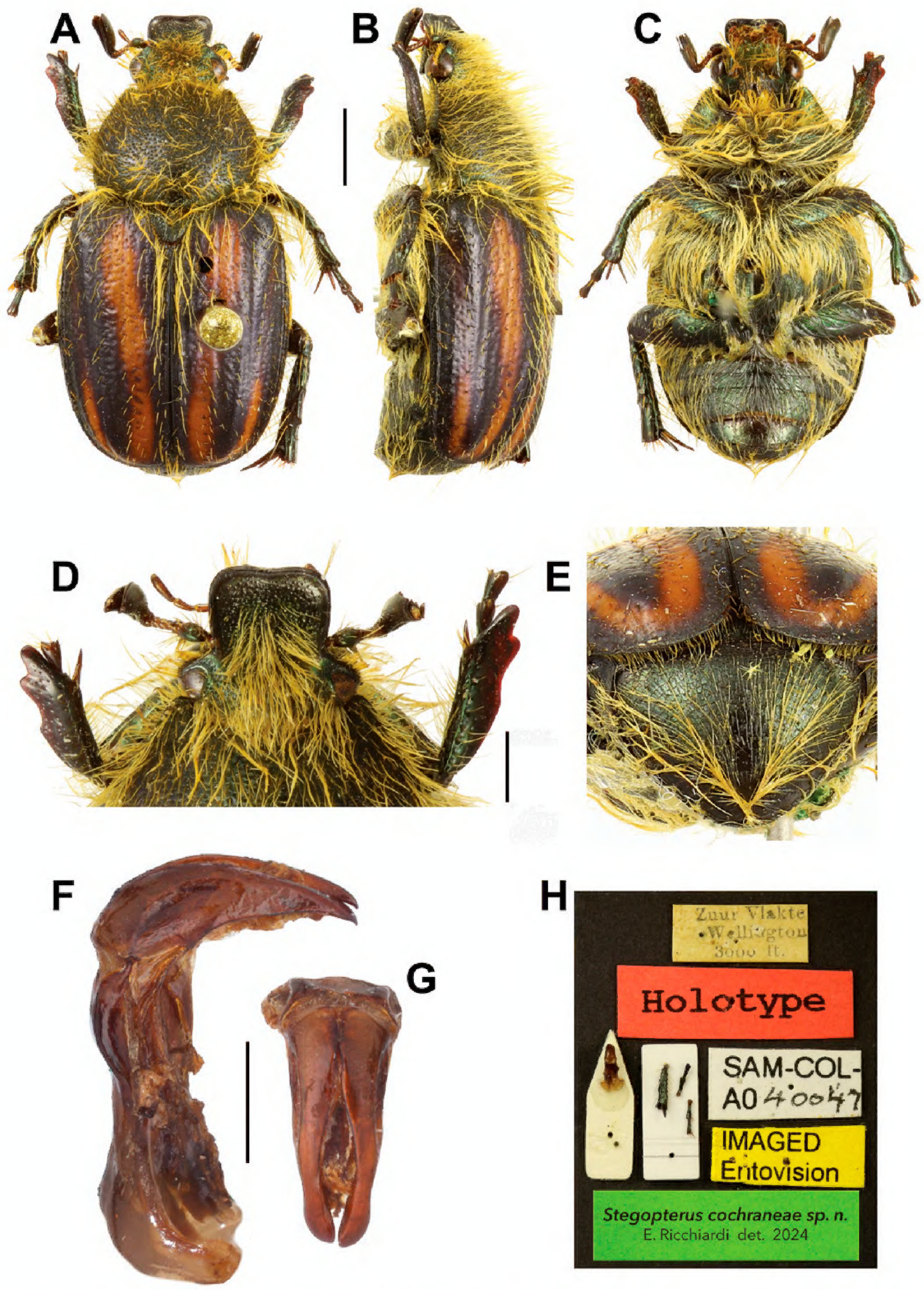

Figure 6. *Stegopterus cochraneae* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head **E** pygidium **F** Parameres, lateral view **G** parameres, frontal view **H** labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 1 mm (**D, E**); 1 mm (**F, G**).

Type series variability. The metallic green hue that is so prominent in the holotype is much reduced in the paratypes, and the black band bordering the elytra is reduced in one of them. Sometimes the clypeus is covered with long, testaceous setae. Some specimens have more enlarged black areas on the elytra. Also, the pronotal metallic colour varies from blue to green or even purple.

Etymology. This species is dedicated to Margie Cochrane, a former curator at SAMC. Noun in the genitive singular case.

Distribution. This is a high-altitude dweller that occurs across the entire mountainous area between the towns of Paarl, Franschhoek and Worcester. This area comprises the Hawekwaberge and the Dutoitsberge ranges (Fig. 21).

Remarks. The female is yet unknown and there is no available information on the biology/ecology of this species.

***Stegopterus endroedyi* sp. nov.**

https://zoobank.org/6E6412FD-A677-41B4-9B73-BD7DE4EE7C80

Fig. 7

Type material. ***Holotype*.** South Africa – WCP • ♂; Swartberge, Blesberg-E; 23°25'S [33°25'S], 22°41'E; 2000 m; 6 Nov. 1978; Endrödy-Younga leg.; grass-netting; E-Y: 1590; TMSA.

***Paratypes*.** South Africa – WCP • 1 ♂; same data as for holotype but 1820 m; on flowers; E-Y 1513; TMSA • 3 ♂; same data as for preceding but singled; 2000 m; 5 Nov. 1978; TMSA.

Diagnosis. *Stegopterus endroedyi* sp. nov. differs from *S. agulhas* sp. nov. by having the clypeal lateral margin strongly reborded and slightly narrowing towards the base. Its pygidial surface is covered with round, scattered punctures and the tridentate protibia exhibits regularly spaced teeth (see dichotomous key). The shape of its parameres is also distinctive (Fig. 7G, H).

Description. Male (holotype). *Measurements*. Total length = 11.9 mm; maximum width = 6.0 mm. ***Body*.** Stocky, with melolonthinoid shape, black, with some metallic hue; head, pronotum and scutellum with predominant metallic green hue but black margins; anterior half of clypeus glabrous, posterior half with scattered, long, testaceous setae. ***Head*.** Clypeus. wider than long (1.6 times), deeply hollowed, covered with thick, round punctures, somewhat confluent at sides; anterior corners rounded, anterior margin retuse, lateral margins strongly reborded and slightly narrowing towards base (Fig. 7D); antennal club brown to brownish, arched, 1.3–1.5 times clypeus length. ***Pronotum*.** Covered with thick, long, testaceous setae; pronotum covered with round, deep, dense punctures, confluent at sides. ***Scutellum*.** Covered with dense round punctures, imbricate at centre and on anterior margin. ***Elytra*.** Dark testaceous, with colour pattern similar to that of *S. suturalis*, but with anteapical humbones blackish; posterior border of elytra without blackish margin and shagreened; discal striae effaced, entire surface covered with scattered, round punctures; lateral declivity shagreened; large sutural/juxtascutellar black band with violet hue reaching apical margin; all other margins narrowly black. ***Pygidium*.** Black with prominent metallic green hue; imbricate, with scattered, very long and testaceous setae. ***Legs*.** Black with copper metallic hue; protibia externally tridentate; with proximal tooth rounded and obsolete; mesotibia strongly bent ventrally; metatibial upper spur slightly curved at apex; metatibial lower spur subequal to upper; second metatarsal segment as long as first. ***Venter*.** Entire surface black with green metallic hue.

Type series variability. The specimens in the type series are very similar, with no significant differences in chromatic or morphological characters.

Etymology. The species takes its name from the renowned Hungarian entomologist Sebastian Endrödy-Younga, who collected the type series. Noun in the genitive singular case.

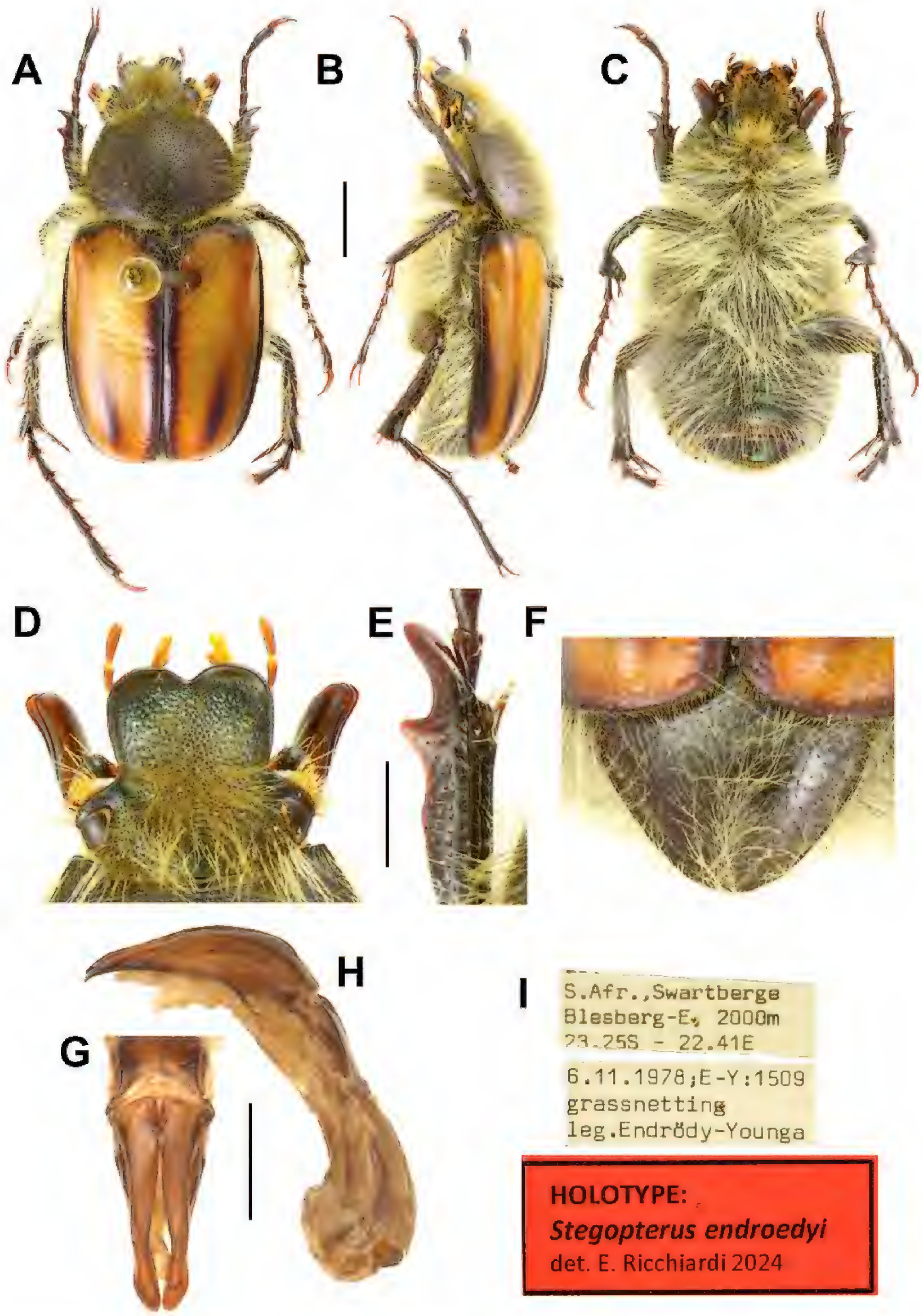

Figure 7. *Stegopterus endroedyi* sp. nov., holotype ♂ TMSA **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head **E** protibia **F** pygidium **G** parameres, frontal view **H** parameres, lateral view **I** labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 1 mm (**D–F**); 1 mm (**G, H**).

Remarks. The female is unknown. Some type labels report as collection coordinates 23°25'S, but these are incorrect and must be replaced with 33°25'S. This new species was already identified by Arthur Evans in the 1980s but never described. There is no available information on the biology/ecology of this species.

Distribution. This species occurs at the easternmost part of the distribution range of the genus *Stegopterus*, in the eastern section of the Groot Swartberg range above the town of Oudtshoorn (Fig. 21).

***Stegopterus fuscus* sp. nov.**

https://zoobank.org/102ECD8A-E546-414A-891C-EB33F05F8E5D

Fig. 8

Type material. Holotype. South Africa – WCP • ♂; Montagu; Oct/Nov. 1919; SAMC: SAM-COL-A040045.

Diagnosis. *Stegopterus fuscus* sp. nov. differs from *S. langebergicus* sp. nov., the closest species, by having the clypeus lateral margin strongly reborded and slightly narrowing towards the base, as well as the protibia externally tridentate with all three teeth equally spaced (see dichotomous key). Moreover, the predominant colour of its integument is fulvous, while in *S. langebergicus* sp. nov. it is black. The shape of its parameres is also quite distinctive (Fig. 8F, G).

Description. Male (holotype). ***Measurements*.** Total length = 10.3 mm; maximum width = 5.1 mm. ***Body*.** Stocky, with melolonthinoid shape; fuscous coloured, head and scutellum black, pronotum black, with green metallic hue; head black, except brownish anterior margin of clypeus; pronotum and scutellum with predominant metallic green hue and black margins; legs brownish, darkened in places. ***Head*.** Glabrous, with some scattered, residual long, testaceous setae; clypeus wider than long (1.7 times), covered with thick, round punctures, somewhat confluent at sides; anterior margin retuse, anterior corners rounded, lateral margins strongly reborded and slightly narrowing towards base (Fig. 8D); antennal clubs missing. ***Pronotum*.** Surface imbricate, covered with residual, scattered, long, testaceous setae. ***Scutellum*.** Covered with dense, round punctures, confluent at sides. ***Elytra*.** Exhibiting large black band joining anteapical and intrahumeral humbones; lateral margin black, apical margin fulvous with scattered, round punctures; striae visible and sculptured with large punctures; lateral declivity horizontally shagreened; presence of large sutural/juxtascutellar black band with green hue, not reaching posterior margin. ***Pygidium*.** Fulvous, wider than long, surface imbricate, covered with residual, scattered, long testaceous setae. ***Legs*.** Protibia tridentate, with all three teeth equally spaced; proximal tooth rounded and obsolete; mesotibia curved, lower spur about 30% shorter than upper spur; second metatarsal segment as long as first. ***Venter*.** Abdomen fulvous, covered with scattered round punctures and very long, backwards-flattened setae.

Etymology. The name is derived from the dark brown (fuscous) colour of most of its body surface. Adjective in the nominative singular case.

Distribution. The only record available for this species was collected near Montagu in the Klein Karoo region. However, as the genus is associated with typical fynbos vegetation, it is likely that the holotype specimen originates from the Kogsmankloof Pass in the Langeberg range, just above the town of Montagu (Fig. 21).

Remarks. The female is unknown and both antennal clubs of the male holotype are missing. There is no available information on the biology/ecology of this species.

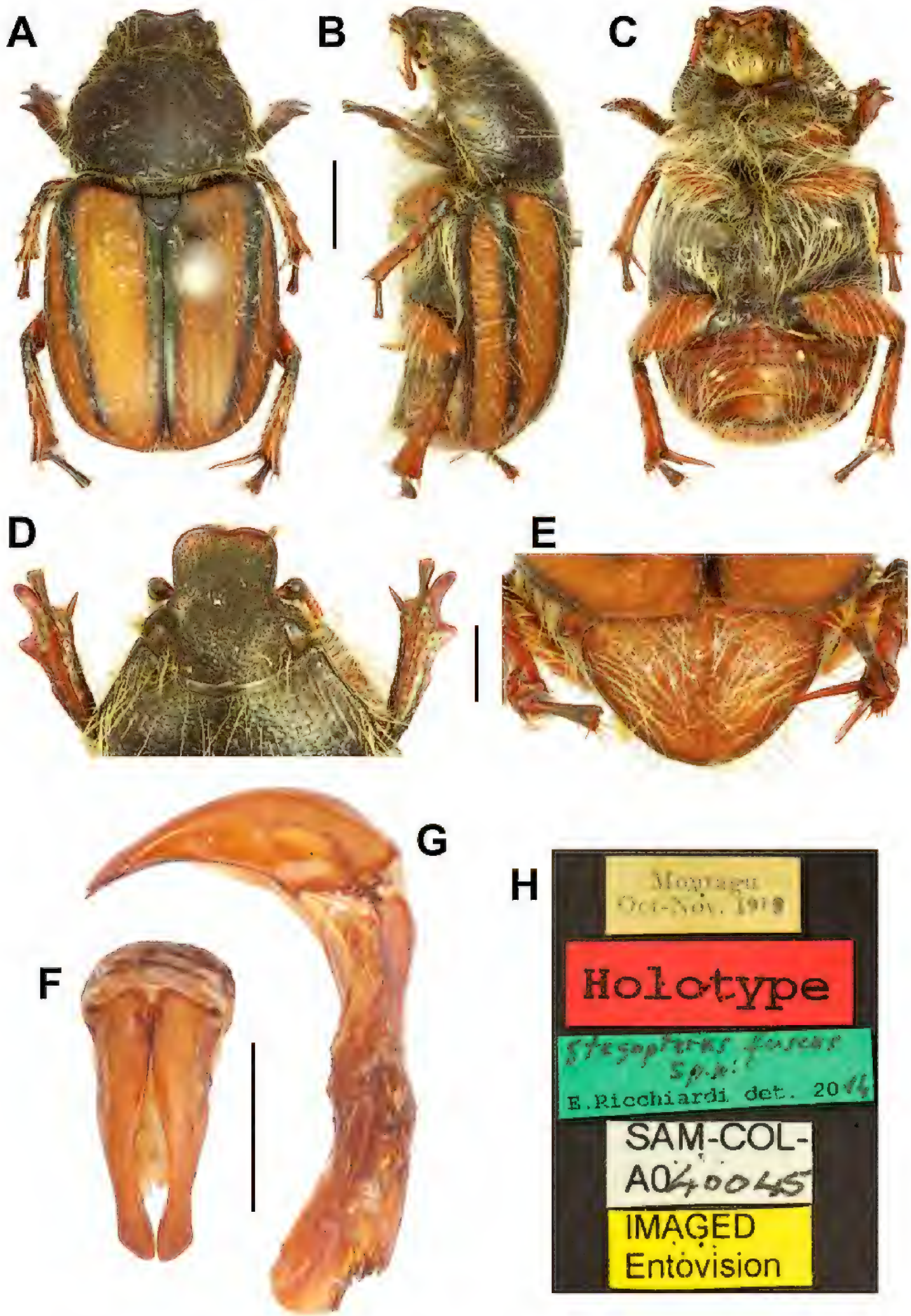

Figure 8. *Stegopterus fuscus* sp. nov., holotype ♂ TMSA **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head and protibia **E** pygidium **F** parameres, frontal view **G** parameres, lateral view **H** labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 1 mm (**D, E**); 1 mm (**F, G**).

***Stegopterus hexrivieri* sp. nov.**

https://zoobank.org/B98BDA77-19DD-49D9-91F0-20DA0A5CE3BE

Fig. 9

Type material. ***Holotype*.** South Africa – WCP • ♂; Hex River; Oct. [18]99; SAMC: SAM-COL-043593.

Diagnosis. *Stegopterus hexrivieri* sp. nov. differs from *S. kromrivieri* sp. nov., the closest species, by having the clypeus colliculate, the apical margin of

its elytra shagreened and the pygidial surface covered with scattered, round punctures, imbricate at sides. The shape of its parameres is also distinctive (Fig. 9F, G).

Description. Male (holotype). ***Measurements*****.** Total length = 12.3 mm; maximum width = 6.4 mm. ***Body*****.** Stocky, with melolonthinoid shape, black, with green metallic hue; elytra fulvous, antennae and legs dark brown; elytra bordered at juxtascutellar and sutural sides by broad black band reaching apex; all other margins narrowly black; humeral humbones prominent; abdomen black, with green metallic hue. ***Head*****.** Mainly covered with very long, dense, testaceous setae bent backwards; clypeus hollowed, wider than long (2.2 times), with anterior margin retuse, anterior corner strongly rounded (about 40–55% of clypeal length), lateral margin strongly reborded and narrowing towards base; surface colliculate; antennal club shorter than clypeus (Fig. 9D). ***Pronotum*****.** Black, wider than long, maximum width posteriorly, covered with thick, long, testaceous setae and round, deep, dense punctures, confluent at sides. ***Scutellum*****.** Black, covered with dense, round punctures. ***Elytra*****.** Fulvous and semi-transparent, with humeral humbones prominent; lateral, posterior, and sutural margins with blackish band, sutural band much larger than others; apical margin with some scattered, round punctures; discal striae effaced, and entire surface covered with scattered, round punctures. ***Pygidium*****.** Dark green, with faint metallic hue; surface imbricate, covered with very long, testaceous setae. ***Legs*****.** Protibia externally tridentate, with distal two teeth much closer to each other than to third; mesotibia strongly bent ventrally, with lower spur shorter than upper; second metatarsal segment as long as first. ***Venter*****.** Abdomen black, with noticeable green metallic hues, covered with tight punctures and very long, backwards-flattened setae.

Etymology. The species name is a noun in apposition, reflecting the Afrikaans spelling of Hex River (Hexrivier), where the holotype was collected.

Distribution. The only available record refers to the Hexrivier (Fig. 21). It may indicate an occurrence across the Hexrivierberge and Hexriviervallei area above the town of Worcester.

Remarks. The female is unknown and there is no available information on the biology/ecology of this species.

Stegopterus kromrivieri **sp. nov.**

https://zoobank.org/067496D4-853F-4169-8468-887E6CA6D6B1

Figs 10, 11

Type material. ***Holotype*****.** South Africa – WCP • ♂; Krom River, Cedar Mtns; [ca. 32°34'S, 19°15'E]; Sep. 1935; K.H. Barnard leg.; SAMC: SAM-COL-A043594.

Paratypes**.** South Africa – WCP • 1 ♂; Olifants R. Mts, Koue Bokkeveld; 4000–6000’ ft [~1200–1800 m].; Sep. 1932, K.H. Barnard leg.; SAMC: SAM COL-A043591 • 1 ♀; Gifberg; 22 Sep. 2001; A. Brinkman & J. Ball leg.; RPRM.

Diagnosis. *Stegopterus kromrivieri* sp. nov. differs from *S. hexrivieri* sp. nov., the closest species, by having the clypeus covered with thick, round punctures, some round, scattered punctures on the apical margin of the elytra, and the pygidial surface imbricate. The shape of its parameres is also distinctive (Fig. 10F, G).

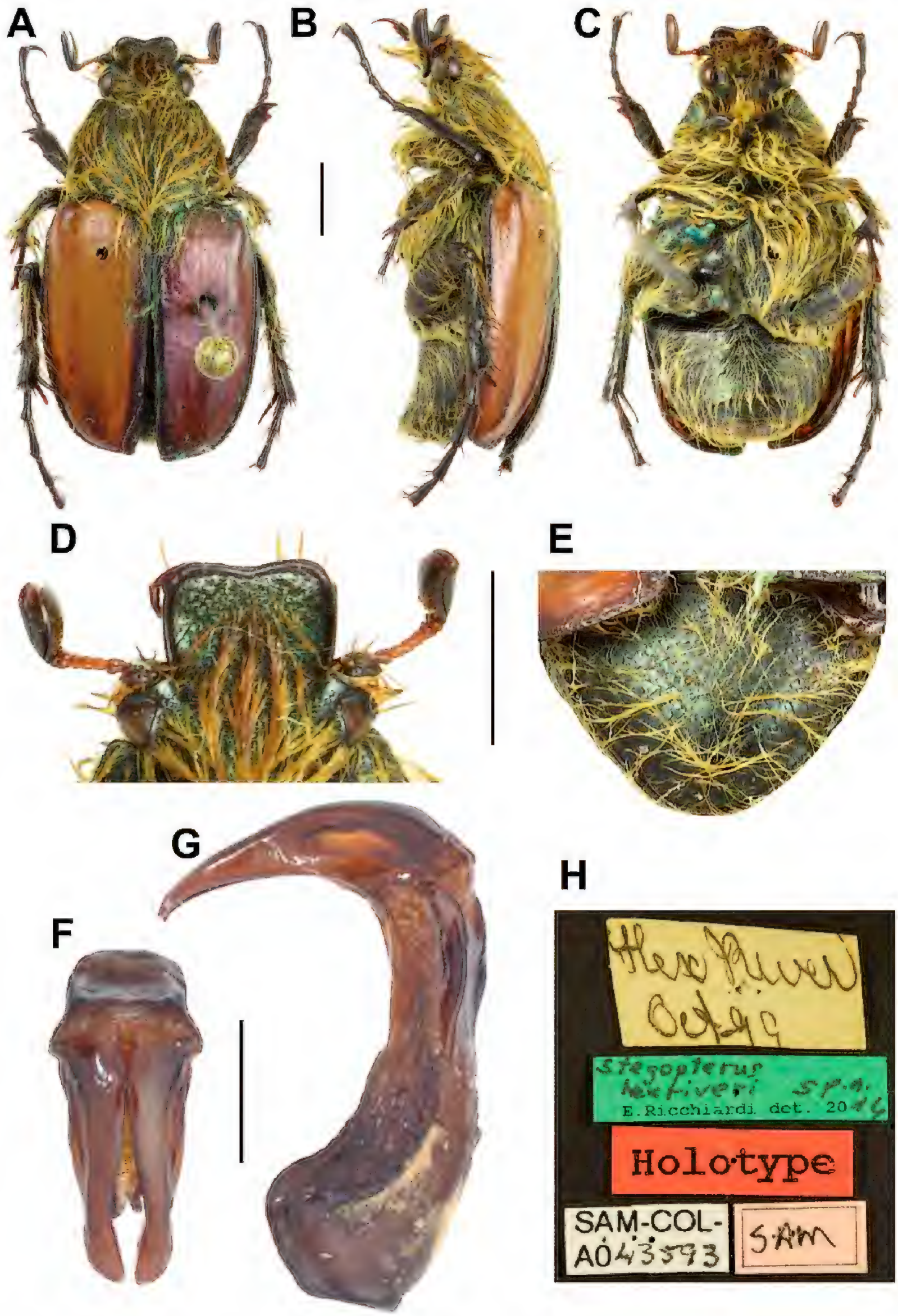

Figure 9. *Stegopterus hexrivieri* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head **E** pygidium **F** parameres, frontal view **G** parameres, lateral view **H** labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 2 mm (**D, E**); 1 mm (**F, G**).

Description. Male (holotype). ***Measurements*****.** Total length = 12.4 mm; maximum width = 6.1 mm. ***Body*****.** Stocky, with melolonthinoid shape, black, with predominant green metallic hue on head vertex, pronotum, pygidium, abdo-

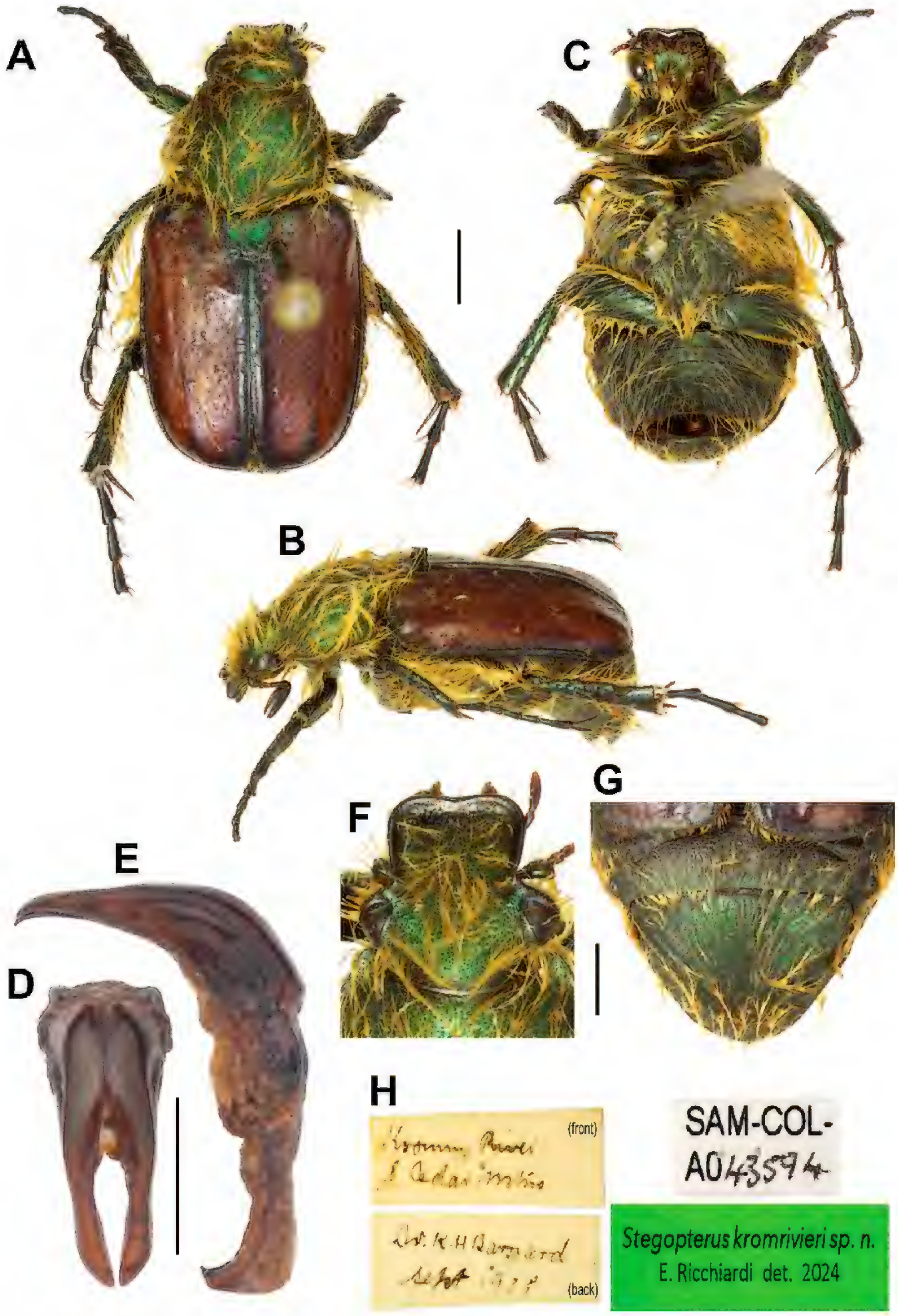

Figure 10. *Stegopterus kromrivieri* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** parameres, frontal view **E** parameres, lateral view **F** head **G** pygidium **H** labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 1 mm (**D, E**); 1 mm (**F, G**).

men and legs. Humeral humbones prominent. ***Head.*** With dark orange-brown antennae; clypeus black with metallic green hue on vertex, completely covered with testaceous, very long, dense, backwards-bent setae; clypeus hollowed, wider than long (2.2 times), with anterior margin retuse and anteri-

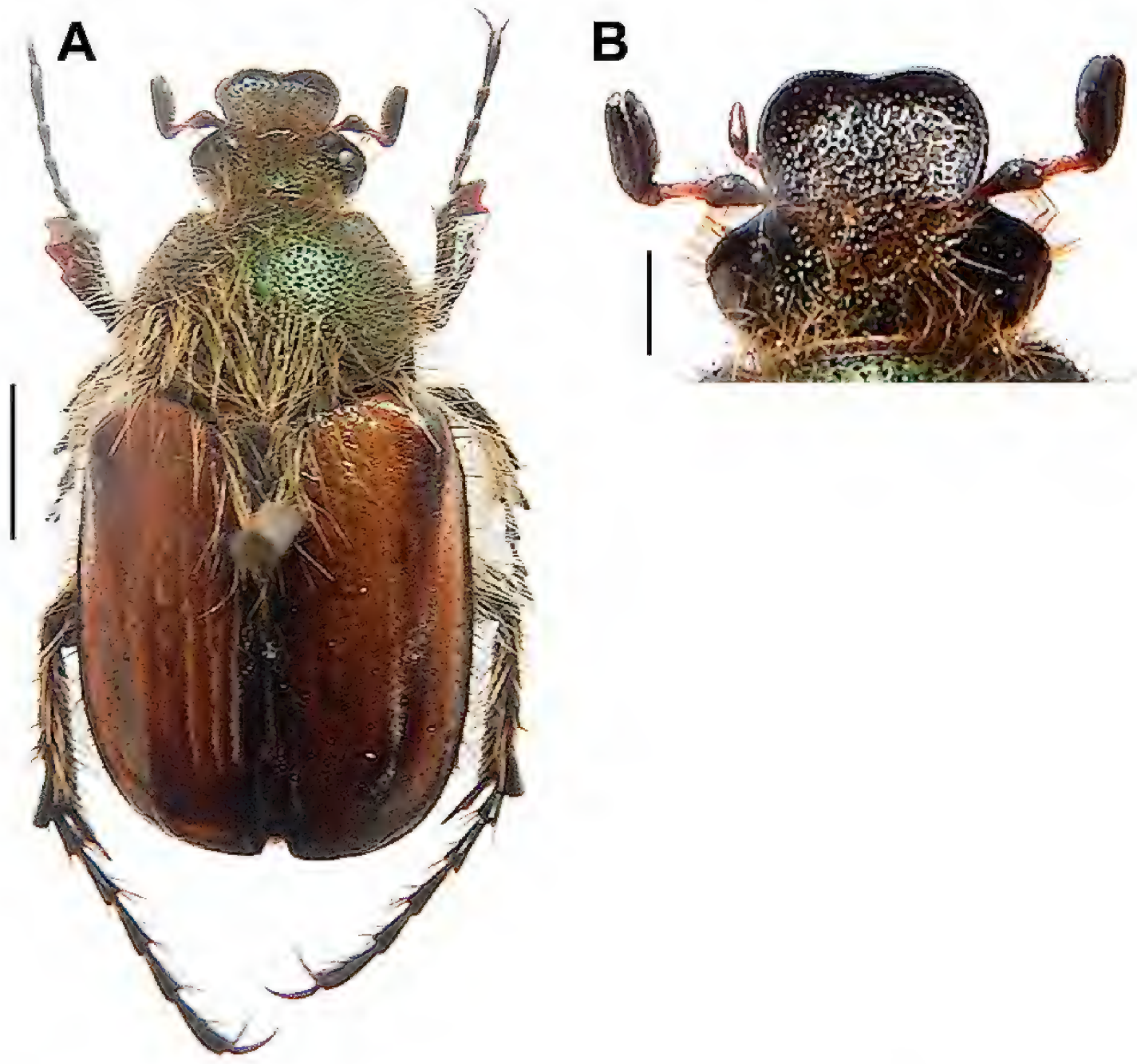

Figure 11. *Stegopterus kromrivieri* sp. nov., paratype ♀ RPRM **A** dorsal habitus **B** head and antennae. Photographs: Lynette Clennell. Scale bars: 2 mm (**A**); 1 mm (**B**).

or corner strongly rounded (about 40–55% of clypeal length), lateral margin strongly reborded and narrowing towards base; surface colliculate; antennal club shorter than clypeus. ***Pronotum*.** Wider than long, maximum width posteriorly; green metallic hued, covered with thick, long, testaceous setae and round punctures, sometimes irregularly confluent on sides. ***Scutellum*.** Metallic green, glabrous, covered with dense, round punctures. ***Elytra*.** Dark fuscous; bordered with black band, widening in juxtascutellar-sutural margin; humeral and intrahumeral humbones black; with apicosutural corner rounded and posterior border exhibiting some scattered, rounded punctures; discal striae effaced, surface covered with scattered, round punctures. ***Pygidium*.** Black, with prominent metallic green hue; wider than long, imbricate and covered with long, testaceous, flattened setae. ***Legs*.** Black with green metallic hue; protibia externally tridentate, with distal two teeth closer to each other than to third and third tooth reduced to sinuation; mesotibia strongly bent ventrally and with apex exhibiting reddish, regularly spaced setae; metatibia with lower spur about 50% longer than upper; second metatarsal segment as long as first. ***Venter*.** Abdomen with green metallic hue, covered with large, round punctures and very long, backward flattened setae.

Paratype (♀) (differences from ♂ only). Measurements: total length = 10.4 mm; maximum width = 5.4 mm. Body stockier than that of the holotype, dorsal colour displays the same pattern but is lighter in comparison to the

male. Head, pronotum, and scutellum setose as in holotype, but they appear coppery to light green instead of metallic green. Antennal club shorter than length of the clypeus, measuring about 0.8 times as long. Protibia broader than that of the holotype, tridentate, with teeth equally spaced (Fig. 11).

Etymology. The species name is a noun in apposition, reflecting the Afrikaans spelling of Krom River (Kromrivier), where the holotype was collected.

Distribution. This is a typical Cederberg dweller, occurring across the entire mountain range and reaching as far south as the Koue Bokkeveld region (Fig. 21).

Remarks. Currently, there is no available information on the biology/ecology of this species.

***Stegopterus lamellus* sp. nov.**

https://zoobank.org/9BFDF600-658F-44A6-9F34-05E0CEAAA58F

Fig. 12

Type material. ***Holotype.*** South Africa – WCP • ♂; Cloete's Pass; Oct. 1937; SAMC: SAM-COL-A043587.

Paratypes. South Africa – WCP • 1 ♂; same data as for holotype; SAMC: SAM-COL-A043587 • 3 ♂ Vreyersberg; Oct. 1937; SAMC: SAM-COL-A043586.

Diagnosis. *Stegopterus lamellus* sp. nov. differs from *S. septus*, the closest species, by its protibia being externally tridentate, with the first two teeth closer to each other than to the third and the metatibia lower spur being shorter than the upper (about 73%). Its antennae are peculiar, with clubs longer than the clypeus l (1.7 times) and notably bent in their apical third. The shape of its parameres is also distinctive (Fig. 12F, G).

Description. Male (holotype). ***Measurements.*** Total length = 12.9 mm; maximum width = 6.8 mm. ***Body.*** Stocky, with a melolonthinoid shape; black to brownish, with greenish-purple metallic hue on head, pronotum and scutellum; pygidium black with greenish-purple metallic hue; antennae brownish; elytra fulvous with lateral margins, fringed with thin black band and another larger black band with greenish-purple metallic hue along sutural margin and juxtascutellar area, widening on juxtascutellar-sutural side; humeral humbones prominent. ***Head.*** Clypeus glabrous but vertex with long, scattered, testaceous setae; clypeus wider than long (2.2 times), hollowed, covered with thick, round punctures, confluent at sides; anterior margin slightly retuse, broadly and mildly indented at centre; anterior corner rounded (about 40–55% of clypeal length); lateral margins strongly reborded and slightly narrowing towards base; antennal clubs longer than clypeus (1.7–1.8 times), markedly bent at apical one-third. ***Pronotum.*** Wider than long, with maximum width posteriorly; covered with thick, long, testaceous setae and deep round punctures, sometimes irregularly confluent at sides. ***Scutellum.*** Glabrous, covered with dense, round punctures. ***Elytra.*** With apicosutural corner rounded and posterior border exhibiting some scattered, round punctures; discal striae visible and punctuated with large, round, locally confluent punctures; second interstria with or without short line of round points at middle. ***Pygidium.*** Wider than long, surface imbricate, covered with long, testaceous, scattered and flattened setae. ***Legs.*** Black; protibia externally tridentate, distal two teeth

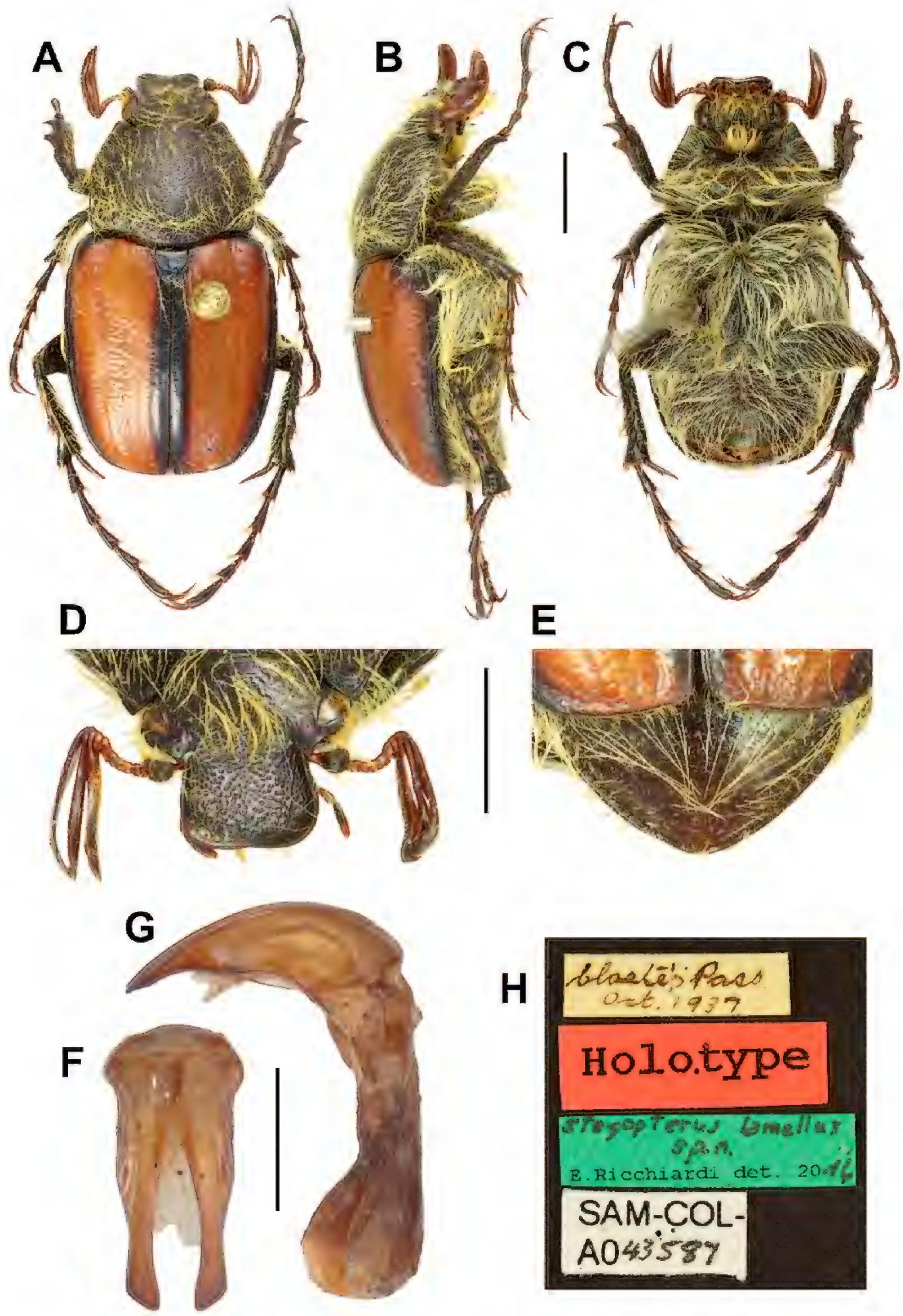

Figure 12. *Stegopterus lamellus* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head **E** pygidium **F** parameres frontal view **G** parameres, lateral view **H** labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 2 mm (**D, E**); 1 mm (**F, G**).

closer to each other than to third; mesotibia curved ventrally, with upper spur straight and lower one-third shorter; second metatarsal segment as long as first. ***Venter.*** Abdomen black, with greenish metallic hue, covered with very long, backwards flattened testaceous setae.

Type series variability. All the type specimens are identical; however, in all four paratypes, the pygidium is dark fulvous rather than brown-black like in the holotype.

Etymology. The name of this species is derived from the unique and typical shape of its antennal clubs. Adjective in the nominative singular case.

Distribution. The few available records indicate that this species may be restricted to the mountain area between the southeastern end of the Langeberg and the western section of the Outeniekwaberge (Fig. 21).

Remarks. The female is unknown and there is no available information on the biology/ecology of this species.

***Stegopterus langebergicus* sp. nov.**

https://zoobank.org/CB09F79E-4D74-42D5-977E-21595DFC58A1

Fig. 13

Type material. ***Holotype*.** South Africa – WCP • ♂; Boosmansbos Wilderness Area, Saagkuilkloof trail above river canyon; 33°57.85'S, 20°50.41'E; 500 m; 30 Nov. 2015; Fikacek & Vondracek leg.; flowering fynbos and mountain meadows from white flowering plants; TMSA.

***Paratypes*.** South Africa – WCP • 1 ♂ same data as for the holotype; ERPC • 2 ♂; Barrydale; Oct. 1990; C.R. Owen leg.; ERPC • 1 ♀; Barrydale; 1–3 Nov. 1997; Lizler leg.; ERPC • 1 ♂ Tradows Pass, near top of Mt; 1 Jan. 1986; LACM • 1 ♂; Swellendam; 28 Nov./1 Dec.1997; Ivo Jeniš & Milan Krajcik leg.; NHMUK: BMNH-E 2015-37.

Diagnosis. *Stegopterus langebergicus* sp. nov. differs from *S. fuscus* sp. nov., the closest species, by having the clypeal lateral margin rebordered and narrowed toward base. Protibia externally three-toothed, with first two teeth closer than the third. The shape of its parameres is peculiar (Fig. 13F, G).

Description. Male (holotype). *Measurements*. Total length = 15.3 mm; maximum width = 7.2 mm. ***Body*.** Stocky, with melolonthinoid shape; black, with some green metallic hue on head, pronotum, scutellum, pygidium and abdomen; antennal scape and legs black, but antennal segments and clubs as well as tarsi brownish; elytra fulvous with lateral margins fringed with black band fading towards apex; large black band also bordering sutural and juxtascutellar margins; striking black band joining anterior external corner of elytra to anteapical humbone; humeral humbones prominent. ***Head*.** Clypeus wider than long, glabrous, black with green metallic hue, deeply hollowed and covered with dense round punctures confluent at sides; anterior corner shortly rounded (about 33% of clypeal length); lateral margin mildly reborded and narrowing towards base; clypeal disc and vertex covered with testaceous, very long, scattered, erect setae; antennal club slightly curved, and 1.1 times the clypeal length. ***Pronotum*.** Wider than long, with maximum width posteriorly; surface covered with round, dense punctures, imbricate at sides and with scattered, long, erect testaceous setae. ***Scutellum*.** Covered with scattered, round punctures. ***Elytra*.** Fulvous, semi-transparent with apicosutural corner rounded; apical margin with some rounded, scattered or dense punctures in places; striae visible and sculptured with round, locally confluent punctures; second interstria

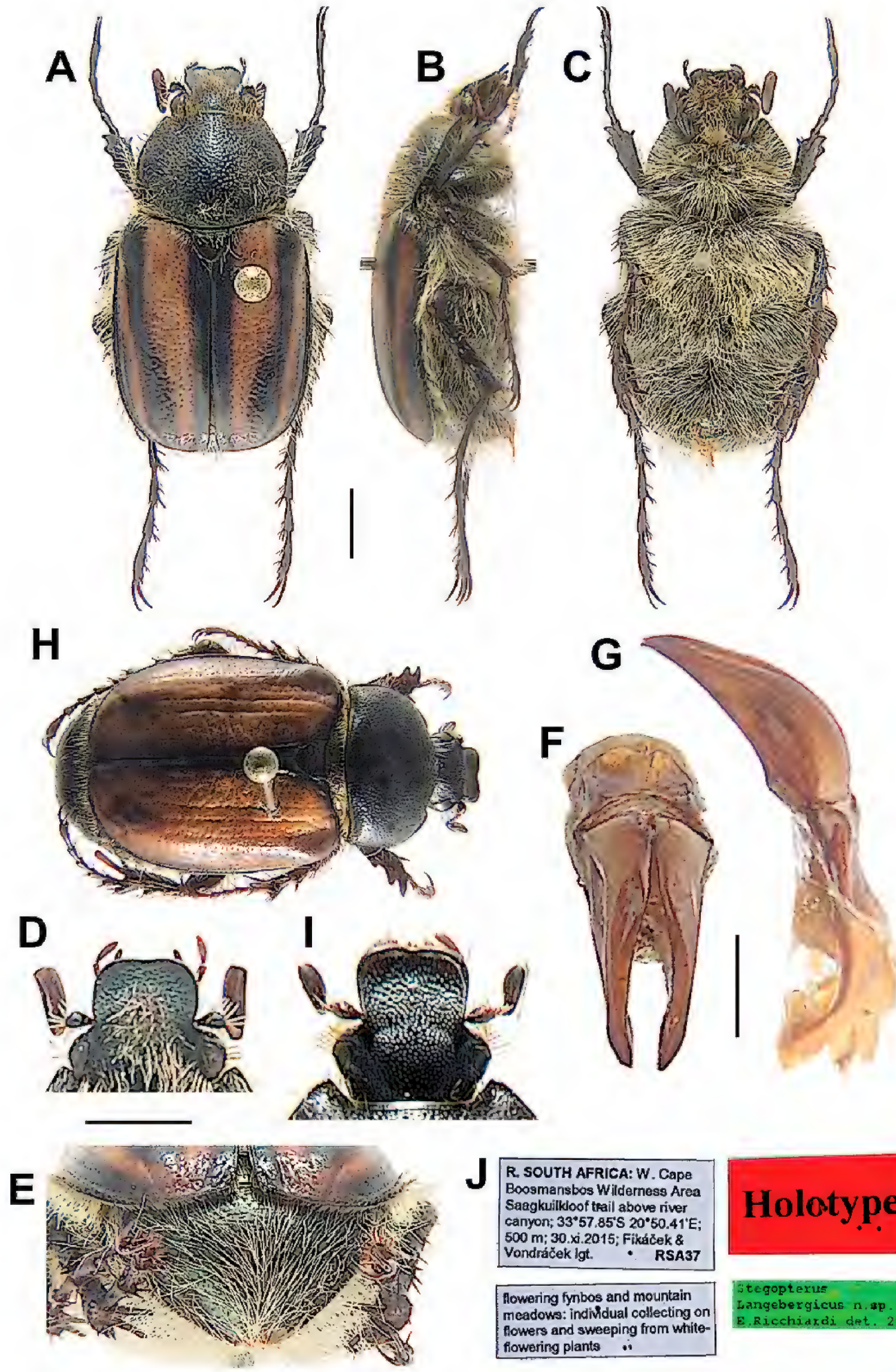

Figure 13. *Stegopterus langebergicus* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** clypeus **E** pygidium **F** parameres, frontal view **G** parameres lateral view **J** labels. Paratype ♀ ERPC **H** dorsal habitus **I** clypeus. Photographs: E. R. Scale bars: 2 mm (**A–C, H**); 2 mm (**D, E, I**); 1 mm (**F, G**).

with short line of round punctures at middle. ***Pygidium*.** Wider than long; surface imbricate and covered with dense, long, testaceous, flattened setae. ***Legs*.** Protibia externally tridentate, with two distal teeth closer to each other than to third; mesotibia bent ventrally, with apex bearing a row of reddish-brown,

regularly spaced setae; metatibial spurs subequal; second metatarsal segment as long as first. ***Venter*.** Abdomen brownish/black in places, without metallic hue, imbricate, covered with long, backwards flattened, testaceous setae.

Paratype (♀) (differences from ♂ only). The female paratype has a stockier body than the HT male, without metallic hue and much reduced setation. The interstriae of the elytra are often shagreened and the antennal clubs are much shorter than the clypeus. The two metatibial spurs are subequal, but each exhibits a widened and rounded apex, the upper one is particularly enlarged, with a concave and spatulate apex.

Type series variability. Two of the five male paratypes differ from the holotype only in the degree of green metallic hue present. The other two male paratypes resemble the holotype but have a chestnut brown pygidium and show a general absence of setae on their head, pronotum, and pygidium.

Etymology. This species takes its name from the Langeberg range, where it has been recorded thus far. Noun in apposition.

Distribution. This species appears to be restricted to the central Langeberg section, between the towns of Swellendam to the south and Barrydale to the north (Fig. 21).

Remarks. According to label data, specimens were collected on unspecified "white flowering plants".

***Stegopterus paardebergi* sp. nov.**

https://zoobank.org/29450039-7C44-4436-9912-12A34D983841

Fig. 14

Type material. *Holotype*. South Africa – WCP • ♂; N end of Paardeberg; 14 Aug. 1969; SAMC: SAM-COL-A043588.

Diagnosis. *Stegopterus paardebergi* sp. nov. differs from *S. suturalis*, the closest species, by having the anterior corner of its clypeus shortly rounded (about 33% of clypeal length) and the lateral margins mildly reborded and narrowing towards the base. Its antennal clubs are much longer than the total length of its clypeus (2.0 times). The shape of its parameres is peculiar (Fig. 14F, G).

Description. Male (holotype). *Measurements*. Total length = 11.4 mm; maximum width = 5.6 mm. ***Body*.** Stocky, with melolonthinoid shape; black, with greenish metallic hue on head vertex, pronotum and legs; clypeus black, with metallic reddish-copper band along anterior margin; scutellum black, with reddish-copper metallic hue; antennae brownish and elytra testaceous, with sutural and juxtascutellar margins fringed with black band and greenish metallic hue in anterior half but dark testaceous posteriorly; humeral humbones prominent. ***Head*.** Clypeus wider than long (1.8 times), hollowed, covered with thick, rounded punctures and glabrous; vertex covered with long, scattered, testaceous setae; anterior margin of clypeus slightly retuse, almost straight, anterior corners shortly rounded; lateral margins mildly reborded and tapering towards base; antennal clubs much longer than clypeus (2.0 times), slightly arched. ***Pronotum*.** Wider than long, with maximum width posteriorly; covered with scattered, long, testaceous setae and with round, deep, very dense and large punctures. ***Scutellum*.** Covered with very dense to shagreened round punctures. ***Elytra*.** Testaceous, with apicosutural corner rounded and apical margin exhibiting

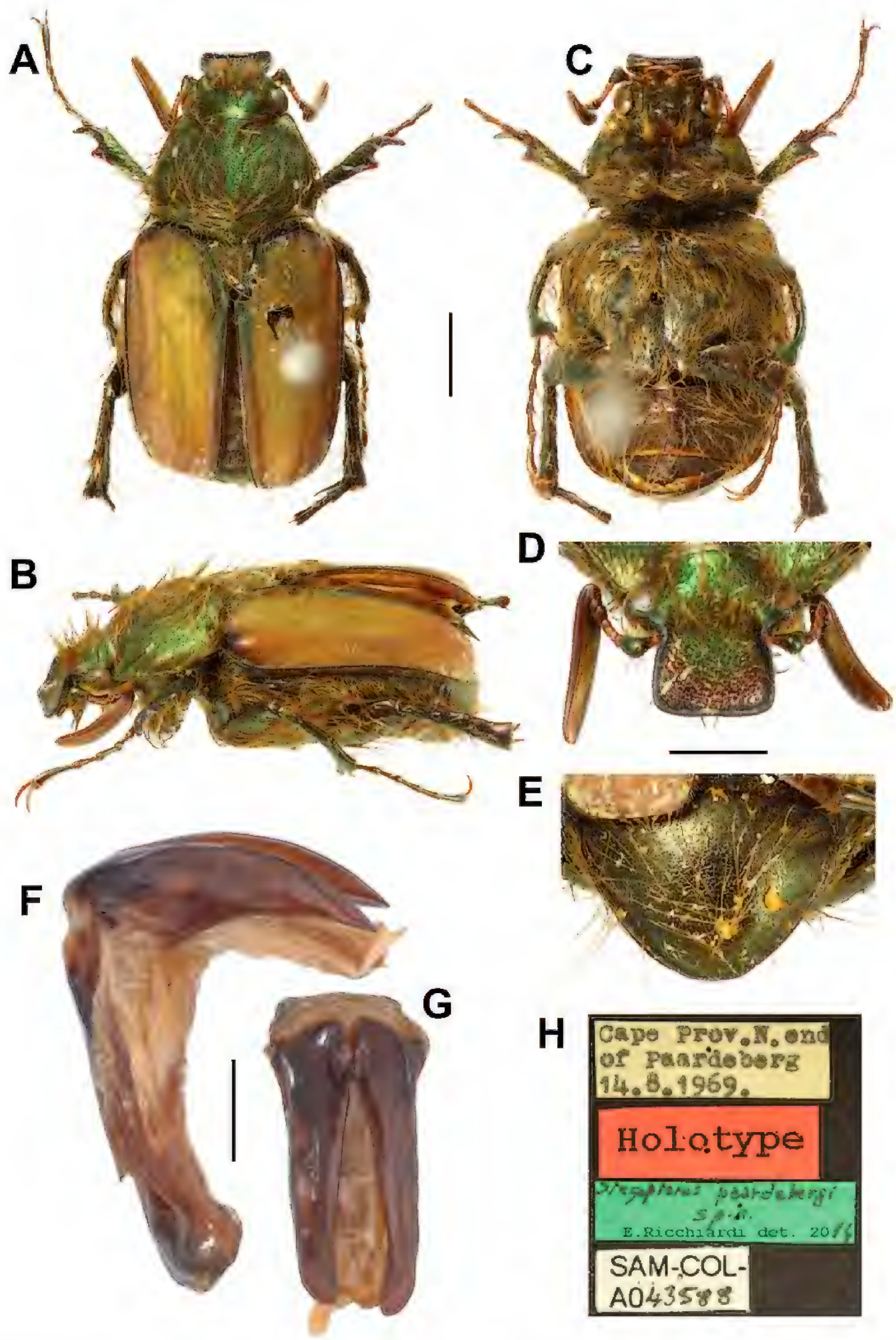

Figure 14. *Stegopterus paardebergi* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head **E** pygidium **F** parameres, lateral view **G** parameres, frontal view **H** labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 1 mm (**D, E**); 0.5 mm (**F, G**).

dense, round punctures; discal striae effaced, with scattered large, round punctures, especially around scutellum; lateral declivity horizontally shagreened. ***Pygidium*.** Wider than long, surface tectiform, covered with very scattered, long, brown, flattened setae. ***Legs*.** Black, with green metallic hue; protibia externally bidentate with distal tooth elongate and rounded at apex; mesotibia strongly bent ventrally, with upper spur straight and lower slightly shorter; second

metatarsal segment as long as first. ***Venter*.** Abdomen black, covered with very long, scattered, dark, testaceous and backward flattened setae.

Etymology. The species name is a noun in apposition, which reflects the name of the locality (Paardeberg) where the holotype specimen was collected.

Distribution. Although there is some reservation about the correct interpretation of the locality reported in the label of the holotype specimen of this species, it seems most likely that this is an inhabitant of the isolated Perdeberg peak, situated in the highly developed Boland region between the towns of Paarl and Malmesbury (Fig. 21).

Remarks. The female is unknown and there is no available information on the biology/ecology of this species.

***Stegopterus pallidulus* sp. nov.**

https://zoobank.org/2CAE8584-FA8E-4167-B843-07EF50EF8409

Fig. 15

Type material. ***Holotype*.** South Africa – WCP • ♂; 7-weeks Poort Berg, Ladismith; 25/31 Dec. 1928; K.H. Barnard leg.; SAMC: SAM-COL-A043590.

Diagnosis. *Stegopterus pallidulus* sp. nov. differs from *S. cochraneae* sp. nov. by having the clypeal lateral margins strongly reborded and slightly narrowing towards the base, as well as the metatibial lower spur subequal to the upper one. The shape of its parameres is also distinctive (Fig. 15F, G).

Description. Male (holotype). ***Measurements*.** Total length = 11.8 mm; maximum width = 5.6 mm. ***Body*.** Stocky, of melolonthinoid shape; black, with greenish metallic hue on head vertex, pronotum and scutellum; clypeal basal half dark brown and apical half bright metallic green; elytra light fulvous; legs black-brown in places. ***Head*.** Clypeus wider than long (1.8 times), hollowed, with anterior margin slightly retuse; anterior corner rounded (about 50% of clypeal length), lateral margins strongly reborded and tapering towards base; covered with thick, round punctures and thick, long, testaceous setae; antennal scapus mainly black, segments fulvous and clubs reddish-brown; inner lamellae on either side with basal patch of short, straight setae; antennal clubs longer than clypeus (1.3 times), slightly arched. ***Pronotum*.** Wider than long, with maximum width posteriorly; surface shagreened, covered with scattered, long, thin and testaceous setae. ***Scutellum*.** Glabrous, covered with dense, round punctures. ***Elytra*.** Light fulvous, with weak apical callosity and discal striae effaced; entire surface covered with scattered, round punctures; sutural and juxtascutellar margins fringed with black band, exhibiting greenish metallic hue in anterior half but dark testaceous posteriorly; lateral margin black; apicosutural corner rounded and apical margin light fulvous, with dense, round punctures. ***Pygidium*.** Wider than long; discal area brown-green metallic, basal third brownish to blackish; surface imbricate, covered with scattered, long, flattened testaceous setae. ***Legs*.** Black, locally brown; metatibia and metatarsi with prominent green metallic hue; protibia externally tridentate, with distal two teeth closer to each other than to third; mesotibia strongly bent ventrally, with apex widened; second metatarsal segment as long as first; lower spur shorter than upper. ***Venter*.** Abdomen black, with dark greenish and brown metallic hue or shine; covered with very long, thin, dark, testaceous and backwards flattened setae.

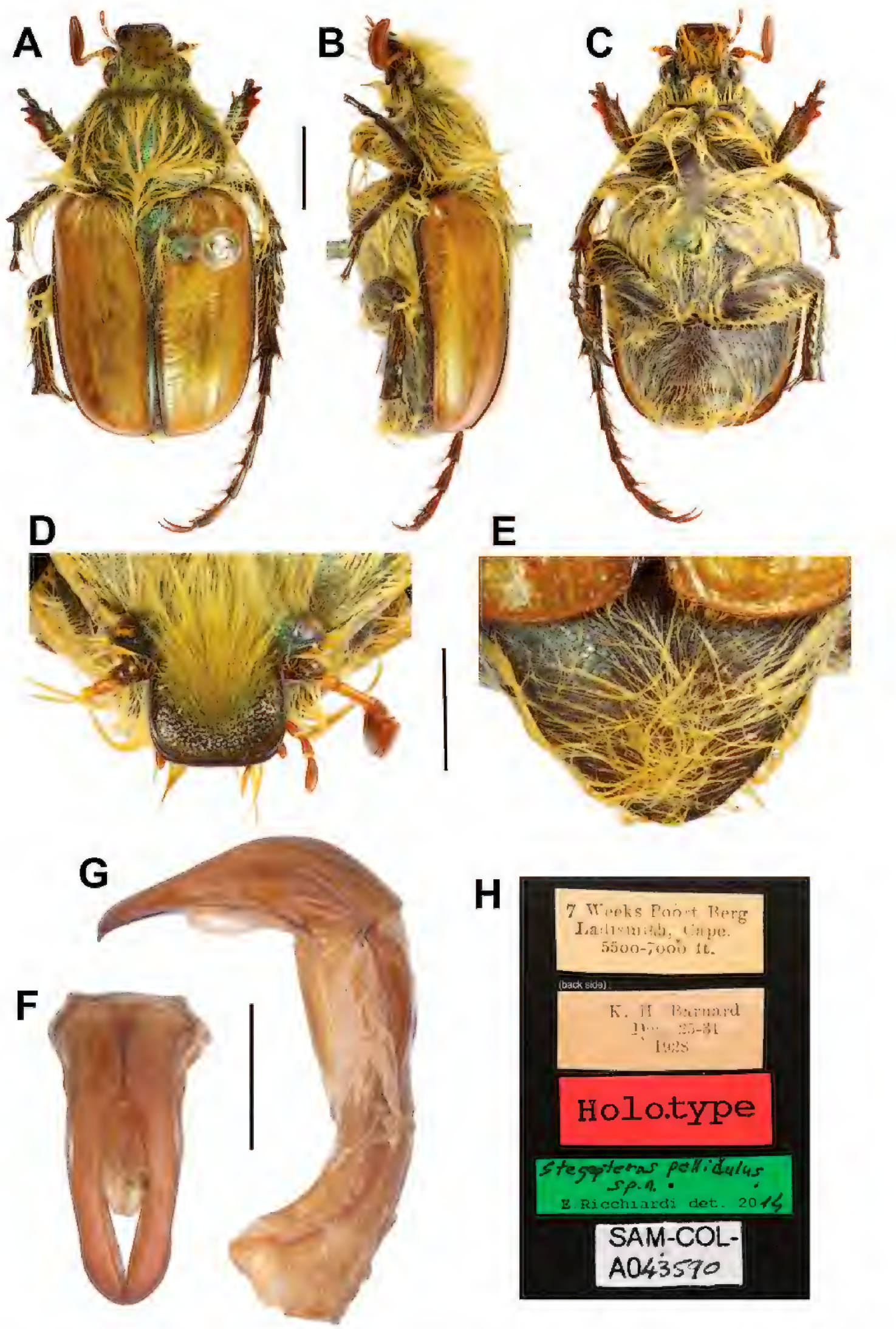

Figure 15. *Stegopterus pallidulus* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head and antennae **E** pygidium **F** parameres, frontal view **G** parameres, lateral view **H** labels. Photographs: W. S. Scale bars: 1 mm (**A–C**); 1 mm (**D, E**); 1 mm (**F, G**).

Etymology. This species is named after the pale, light fulvous colouring of its elytra. Adjective in the nominative singular case.

Distribution. This species is clearly the inhabitant of the Klein Swartberg range, above the town of Ladismith (Fig. 21).

Remarks. The female is unknown, and nothing is known about the biology/ecology of this species.

***Stegopterus rotundiceps* sp. nov.**

https://zoobank.org/2BFED5F9-86AD-4BC7-A819-18BC33306D78

Fig. 16

Type material. *Holotype*. South Africa – WCP • ♂; Clanwilliam, Leipoldt; SAMC: SAM-COL-A043589.

Diagnosis. *Stegopterus rotundiceps* sp. nov. can be identified from the other species of the group by having the clypeal lateral margins mildly reborded and semicircular in shape (Fig. 16E). Its antennal clubs are about 2.1 times longer than the clypeus and its protibia is externally bidentate. The shape of its parameres is also distinctive (Fig. 16F, G).

Description. Male (holotype). *Measurements*. Total length = 10.8 mm; maximum width = 5.2 mm. ***Body*.** Stocky, with melolonthinoid shape; black to brownish with elytra fulvous, exhibiting blackish or brownish band at margins. ***Head*.** Clypeus much wider than long (1.7 times), hollowed, covered with large, round punctures and some scattered, testaceous setae; lateral margins slightly reborded and semicircular in shape; vertex covered with long, testaceous setae; antennal clubs much longer than clypeus (about 2.0 times) and arcuate. ***Pronotum*.** Wider than long, with maximum width posteriorly; with very distinct green midline stretching over two thirds of surface; entire surface covered with shallow, round punctures and long, thin testaceous setae. ***Scutellum*.** Surface covered with shallow, round punctures and scattered, short, testaceous setae. ***Elytra*.** Black, with humeral humbones prominent; apicosutural corner rounded and apical margin exhibiting dense, round punctures; discal striae visible and marked with large punctures; some interstriae and lateral declivity horizontally shagreened. ***Pygidium*.** Wider than long, brownish to blackish with surface shagreened; covered with scattered, long, testaceous and flattened setae. ***Legs*.** Black, locally brown, without green metallic hue; protibia externally bidentate with distal tooth elongate and rounded at apex; mesotibia simply curved ventrally, with the lower spur much shorter than upper; second metatarsal segment as long as first. ***Venter*.** Abdomen brownish, without metallic hue and covered with very long, thick, dark, testaceous setae flattened backwards.

Etymology. The rounded shape of the clypeal lateral margins defines this species. Adjective in the nominative singular case.

Distribution. According to the data reported on the holotype label, this species should occur in the region of the western lower slopes of the broader Cederberg range between the towns of Leipoldtville and Clanwilliam (Fig. 21).

Remarks. The female is unknown, and no information is currently available on the biology/ecology of this species.

***Stegopterus septus* Burmeister & Schaum, 1840**

Fig. 17

Stegopterus septus Burmeister & Schaum, 1840: 406 (original description); Burmeister 1842: 745; Harold 1869: 1342; Péringuey 1907: 299; Schenkling 1922: 14; Krajčik 1999: 49.

Type material. *Lectotype*, here designated. South Africa – WCP • ♂; Caffria; Schaum Type; Coll. Melly; MHNG: MHNG ENTO 0119900.

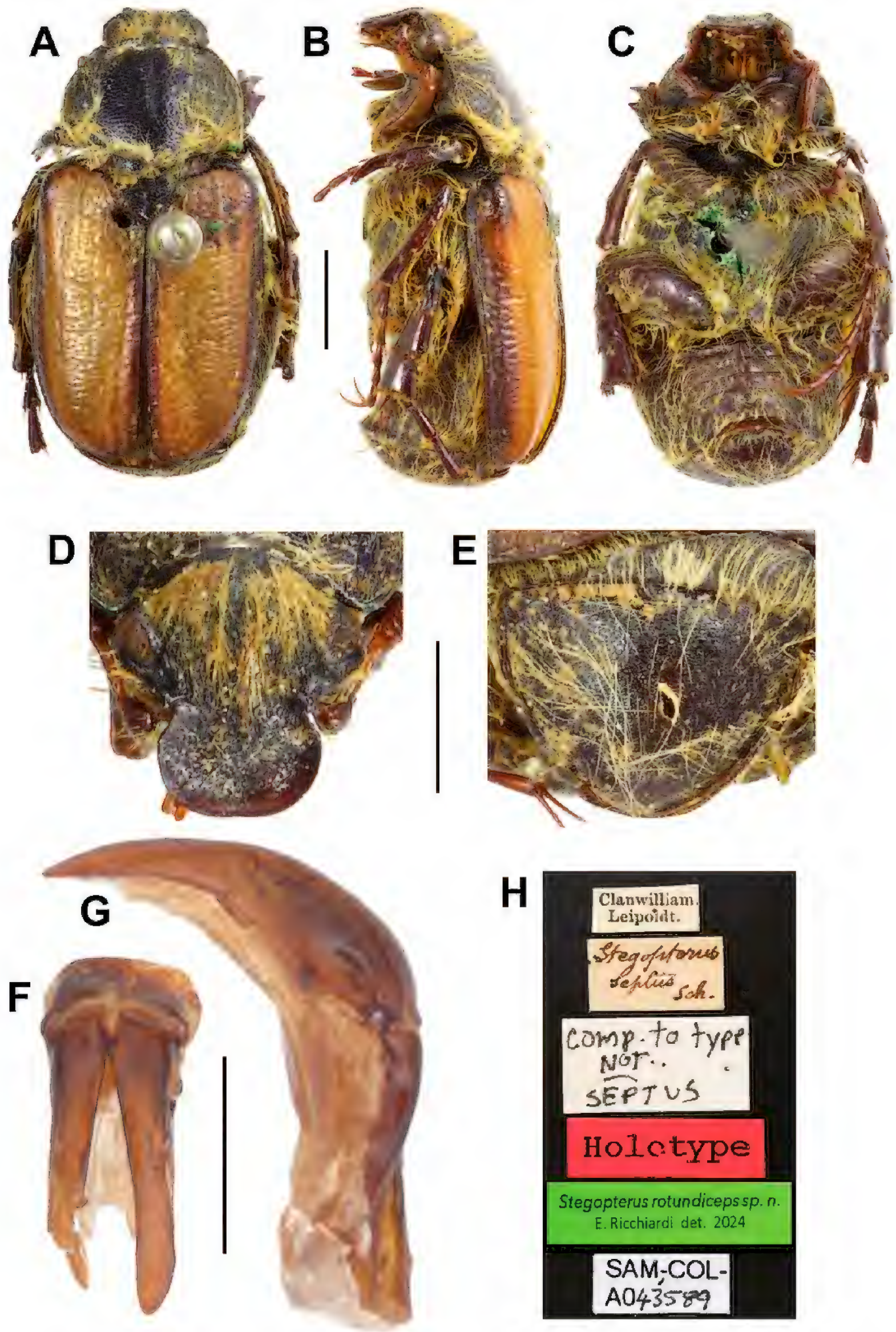

Figure 16. *Stegopterus rotundiceps* sp. nov., holotype ♂ SAMC **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** head **E** pygidium **F** parameres, frontal view **G** parameres, lateral view **H**, labels. Photographs: W. S. Scale bars: 2 mm (**A–C**); 1 mm (**D, E**); 1 mm (**F, G**).

Other material examined. South Africa – WCP • 1 ♂; Hott. Holl. Mts. [Hottentot-Holland Mountains], Steenbras, Nov. 1932; K.H. Barnard leg.; SAMC: SAM-COL-A043575.

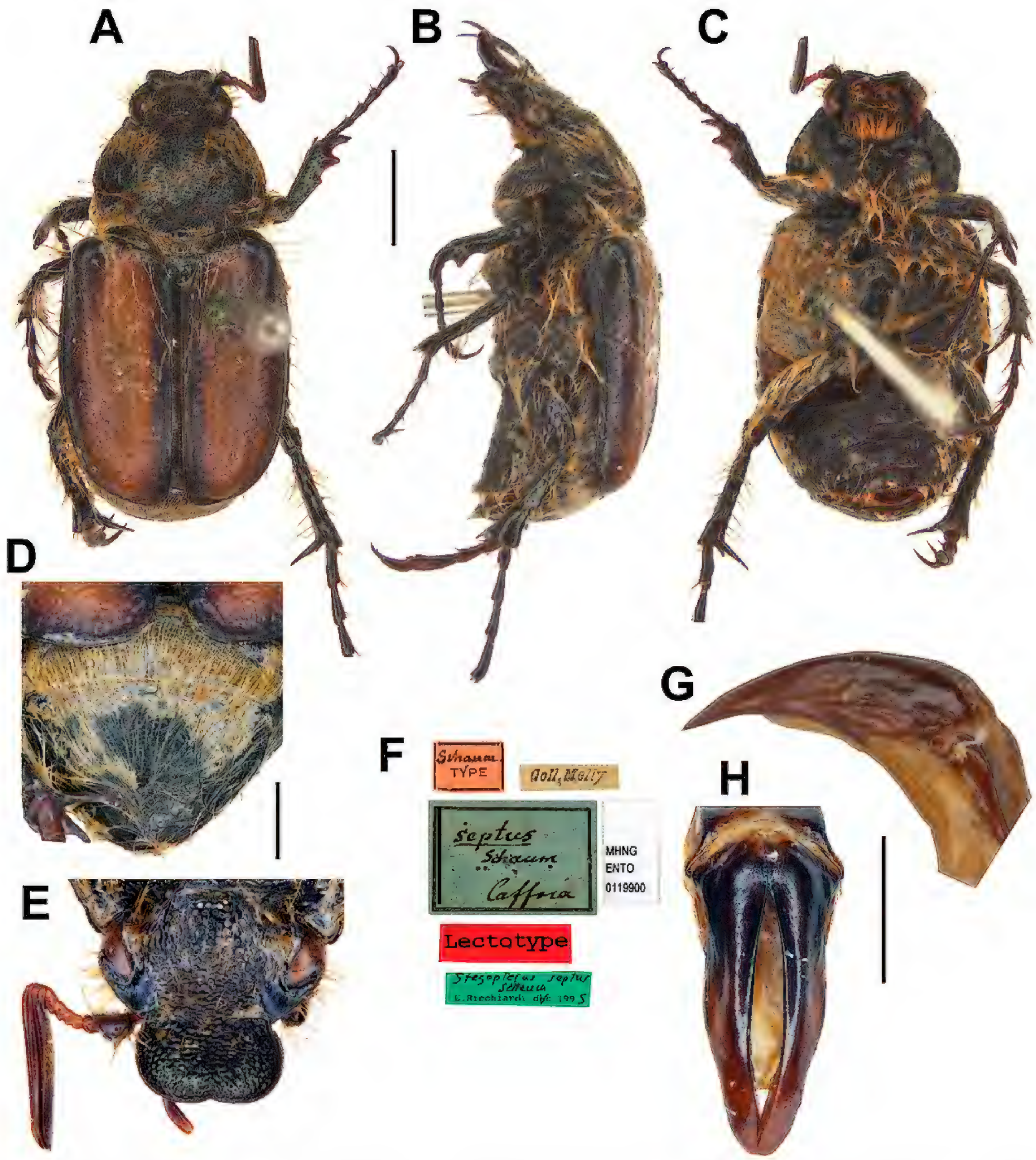

Figure 17. *Stegopterus septus* Burmeister & Schaum, 1840, lectotype (herein designated) ♂ MHNG **A** dorsal habitus **B** lateral habitus **C** ventral habitus **D** pygidium **E** head and antenna **F** labels **G** parameres, lateral view **H** parameres, frontal view. Photographs: Guido Sabatinelli. Scale bars: 2 mm (**A–C**); 1 mm (**D, E**); 1 mm (**G, H**).

Diagnosis. *Stegopterus septus* differs from *S. lamellus* sp. nov., the closest species, by its protibia being externally tridentate and exhibiting all three teeth equally spaced. Its mesotibia is bent ventrally and bears a lower spur much shorter than the upper one (about 30%). Its antennal clubs are very long, about 2.1× longer than the clypeal length.

Distribution. Although the locality reported on the LT label specimen is far too general and equivocal, the available male from the Hottentots-Hollandberge sets the range of this species in the mountain area between the towns of Somerset West and Grabouw (Fig. 21).

Remarks. The syntype preserved in the Melly Collection (MHNG, Fig. 17) and labelled "Schaum Type" was reported in Burmeister and Schaum (1840, p. 406) as preserved in Germar's Collection. Burmeister (1842, p. 745) later specified that there were two males in Germar's Collection but only one is labelled as "Schaum Type". For this reason, the "Schaum Type" preserved in the MHNG, cannot be regarded as the holotype and is therefore designated here as a lectotype.

Péringuey (1907, p. 299) redescribed *S. septus* on the basis of a male collected in Clanwilliam (WCP), which he misidentified as such. That specimen is herein redescribed as the holotype of *S. rotundiceps* sp. nov. Péringuey (1907, p. 299) also reluctantly attributed a second specimen from Knysna to *S. septus*, but we were unable on this occasion to trace and analyse this specimen.

The species is very rare and among all the *Stegopterus* specimens studied, we could identify only two males belonging to *S. septus*. Females remain unknown.

***Stegopterus suturalis* (Gory & Percheron, 1833)**
Fig. 18

Trichius suturalis Gory & Percheron, 1833: 84 (original description).
Trichius (*Tetrophthalmi*) *suturalis*: Kirby 1827: 156 [see comments in Smith 2004: 287 and Smith 2005:75].
Stegopterus suturalis: Burmeister and Schaum 1840: 405; Burmeister 1842: 745; Harold 1869: 1342; Péringuey 1907: 298; Schenkling 1922: 14; Krajčik 1999: 49; Smith 2004: 288; Smith 2005: 75.

Type material. ***Lectotype***, here designated. South Africa – WCP • ♂; Cap. B. sp.; Gory Type; Coll. Melly; MHNG: MHNG ENTO 0119901.

Other material examined. South Africa – WCP • 1 ♂; Cape; TMSA • 5 ♂; Cape Point; 23 Oct. 1973; N.J. Duke leg.; SANC • 1 ♂; same data as for preceding; ERPC • 2 ♂; Claremont; 1883(?); H.W. Vakead leg.; SANC • 1 ♂; Hermanus; Jan. 1938; SANC • 2 ♀; Kirstenbosch C.P.; 23 Nov. 1964; A.L. Carpenter leg.; SANC • 1 ♂ 1 ♀; Stellenbosch, Nov. 87; L.I. leg.; SANC • 1 ♂; Table Mt., Cape Town; 27 Nov. 1921; A.L. Bevis leg.; TMSA • 1 ♂; Table Mts; Hiasterfemch leg.; SANC • 1 ♀; Yzerfontein; ERPC.

Diagnosis. *Stegopterus suturalis* differs from *S. paardebergi* sp. nov., the closest species, by having the anterior corner of its clypeus rounded (about 40–55% of clypeal length) and the lateral margins strongly reborded and slightly narrowing towards base. Its antennal clubs are as long as the clypeus.

Distribution. Together with *S. vittatus*, this is the species that exhibits the largest distribution range and is the most numerous in collections, among all the species of the genus. Its range spans from Hermanus in the south-east to Yzerfontein in the north-west and includes the entire lowland region of the Cape Peninsula and parts of the adjacent Overberg and Swartland regions (Fig. 21).

Remarks. The Gory Type is preserved in Geneva in the Melly Collection (MHNG). The male is here designated as the lectotype. A male in ERPC differs from the lectotype by having the elytra of a brick-red background colour with the black sutural band lacking the green hue. The female from Yzerfontein, in

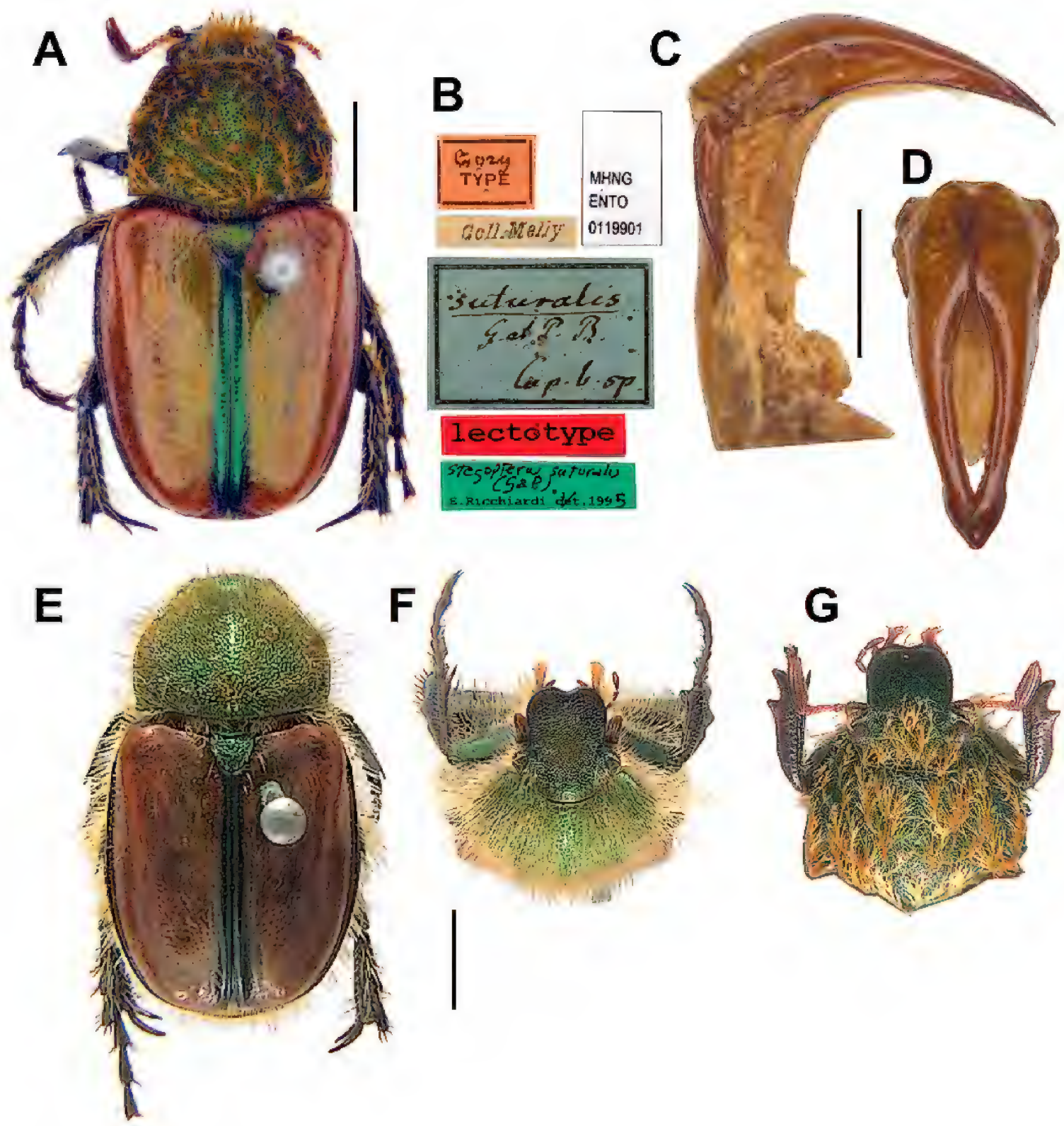

Figure 18. *Stegopterus suturalis* (Gory & Percheron, 1833), lectotype (herein designated) ♂ MHNG **A** dorsal habitus **B** labels C parameres, lateral view **D** parameres, frontal view. Photographs by Giulio Cuccodoro and Guido Sabatinelli. ♀ ERPC **E** dorsal habitus **F** clypeus. Paralectotype ♂ ERPC **G** clypeus. Photographs: E. R. Scale bars: 2.5 mm (**A**); 1 mm (**C, D**); 2 mm (**E, F**).

addition to being stouter than the others and having tridentate protibiae and short clubs, also has identical metallic green reflection. However, its elytra are dark testaceous, and the clypeus is similar to that of the male, but more hollowed anteriorly with a humped, convex forehead.

***Stegopterus vittatus* (Fabricius, 1775)**

Figs 19, 20

Cetonia vittata Fabricius, 1775: 819 (original description).
Trichius vittatus: Gory and Percheron 1833: 83.
Stegopterus vittatus: Burmeister and Schaum 1840: 405; Burmeister 1842: 744; Lacordaire 1856: 562; Harold 1869: 1342; Péringuey 1907: 297; Schenkling 1922: 15; Krajčik 1999: 49.

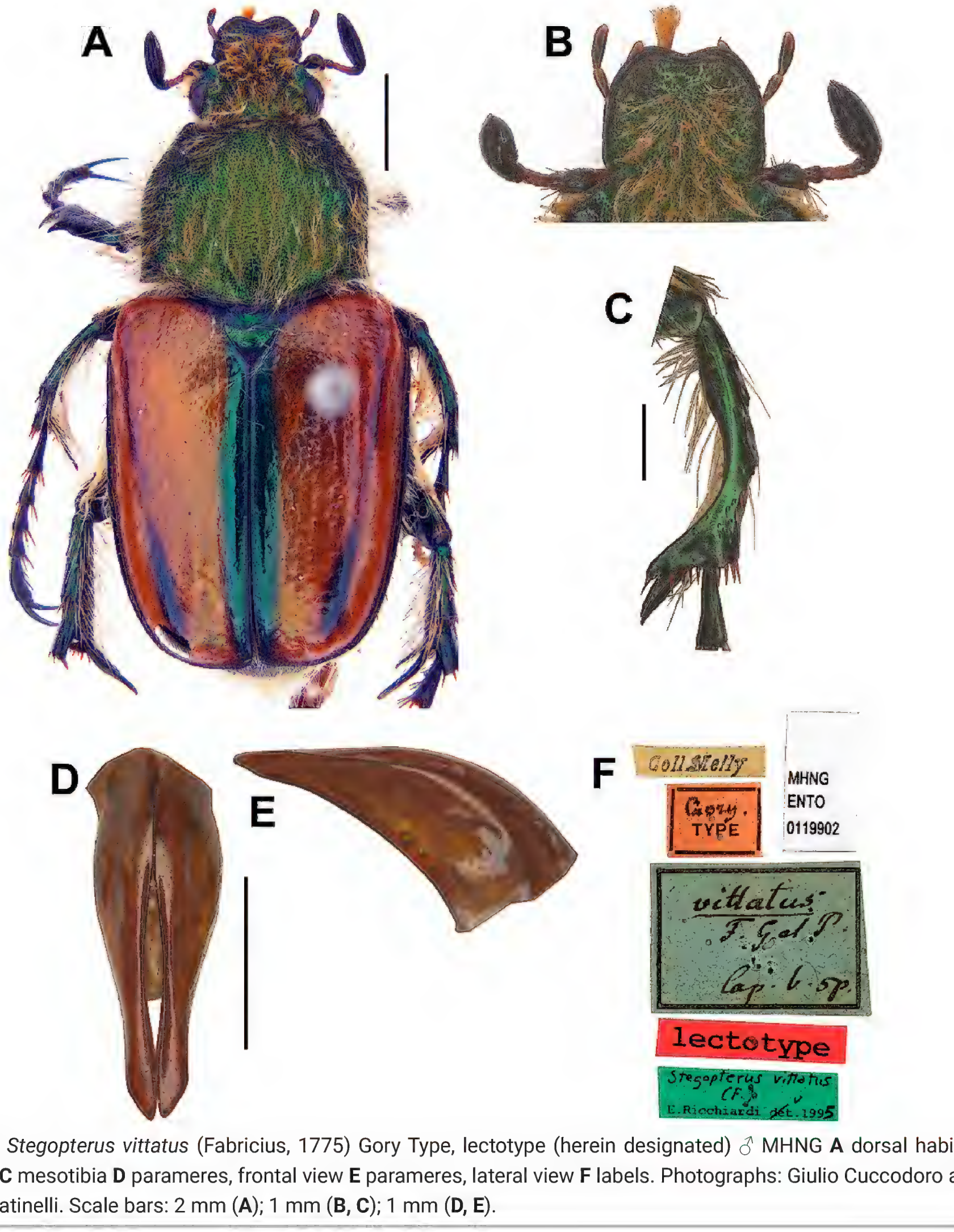

Figure 19. *Stegopterus vittatus* (Fabricius, 1775) Gory Type, lectotype (herein designated) ♂ MHNG **A** dorsal habitus **B** clypeus **C** mesotibia **D** parameres, frontal view **E** parameres, lateral view **F** labels. Photographs: Giulio Cuccodoro and Guido Sabatinelli. Scale bars: 2 mm (**A**); 1 mm (**B, C**); 1 mm (**D, E**).

Type material. ***Lectotype***, here designated. South Africa – WCP • ♂; Cap. B. sp.; Gory Type; Coll. Melly; MHNG: MHNG ENTO0119902.

Other material examined. South Africa – WCP • 1 ♀; Bookram Farm; 30 Aug. 1981; Endrödy-Younga leg.; groundtraps [= pitfall traps], 59 days; ERPC • 1 ♂; Cape Town; Oct. 1988; C.R. Owen leg.; ERPC • 2 ♂; Langebaan; 25 Oct. 1989; J. Glaser leg.; ERPC • 3 ♂; Leipoldtville, Eland's Bay; ERPC • 3 ♂ 1 ♀; Yzerfontein; ERPC.

Diagnosis. *Stegopterus vittatus* is easily identified by the following suite of characters: Mesotibia strongly bent ventrally and with widened apex; external margin of protibia with three equally spaced teeth; antennal clubs shorter than the clypeus.

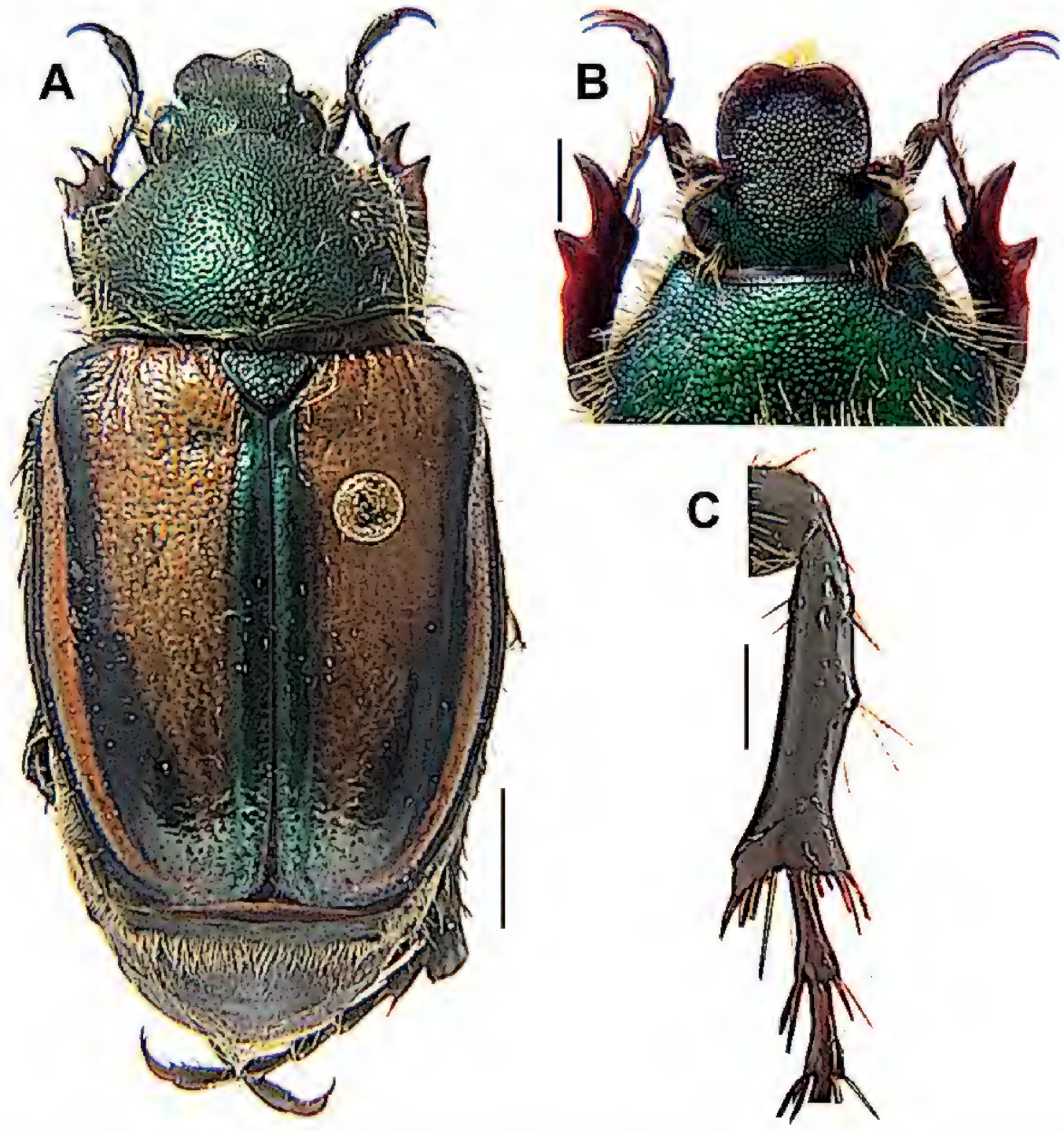

Figure 20. *Stegopterus vittatus* (Fabricius, 1775). ♀ ERPC: **A** dorsal habitus **B** clypeus **C** mesotibia. Photographs: E. R. Scale bars: 2 mm (**A**); 1 mm (**B**); 1 mm (**C**).

Distribution. This is the best-known species in the genus, and its occurrence has been recorded in detail across the entire lowland region, stretching from Cape Point in the south to Lamberts Bay on the west coast (Fig. 21).

Remarks. Among the specimens analysed in this study, there is no particular variation in chromatic or morphological patterns, except in the intrahumeral black band, which is sometimes reduced at the centre but still complete.

Discussion

The species belonging to the genus *Stegopterus* are easily recognisable at first glance from all other South African Trichiini. The genus that is most closely related to it is the monospecific *Pseudostegopterus* Ricchiardi, 2015. However, the characters that distinguish this genus from *Stegopterus* are highlighted in Ricchiardi (2015), particularly in the dichotomous key provided to distinguish the genera of South African Trichiini.

The characters that allow the species of *Stegopterus* to be distinguished from each other are many, but one of them, the sharp ventral bending of the mesotibia, combined with the widening of its apex (Fig. 2B), is a synapomorphy that can be used to divide the fourteen species into two species groups. The first, "*vittatus*," from the name of the type species of the genus, includes

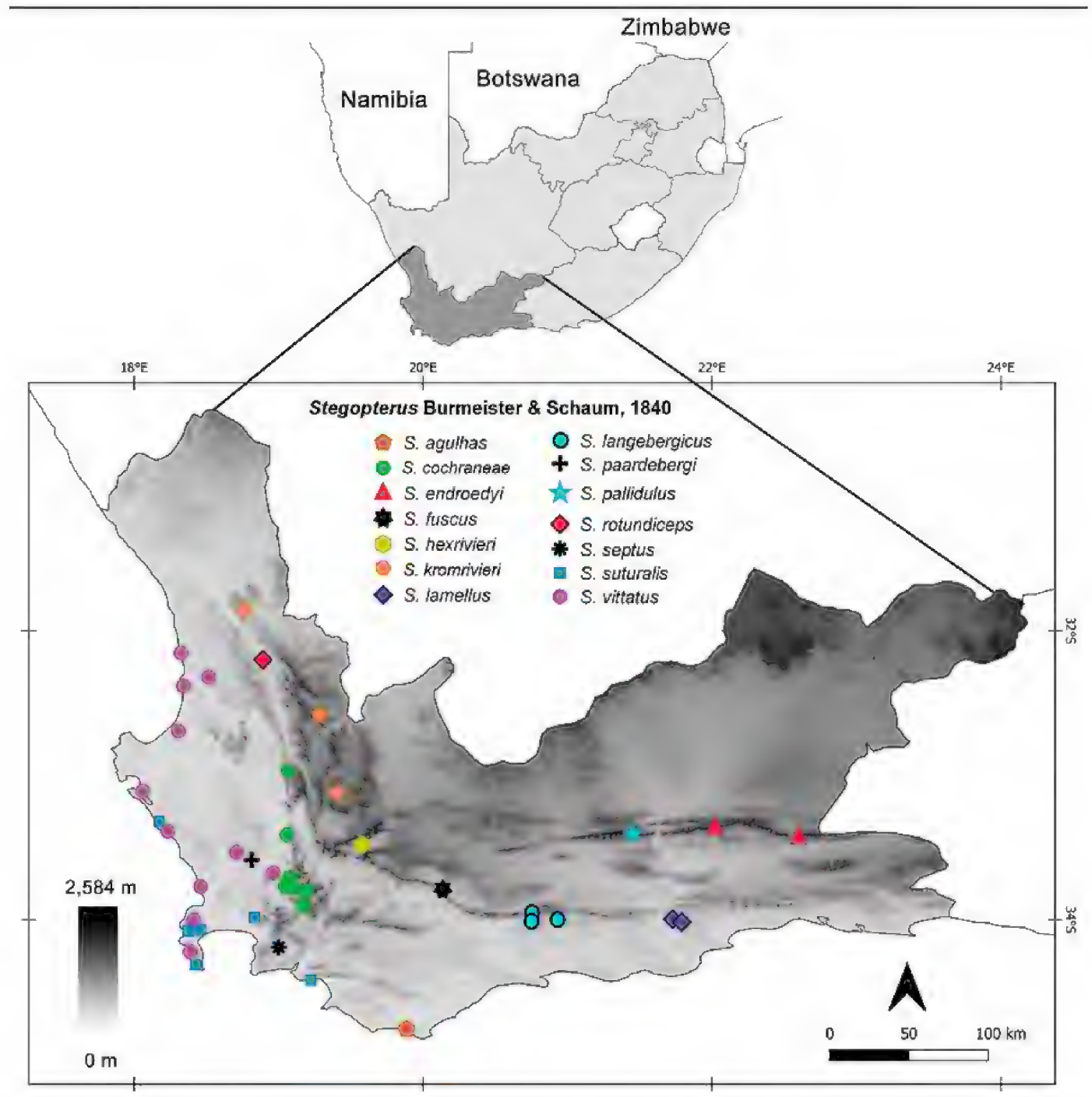

Figure 21. Distribution map of *Stegopterus* species occurring in the Western Cape, South Africa.

nine species, while the second group, "*septus*" includes five species, comprising *S. septus*. The ventral bending of the mesotibiae is a synapomorphic character that has been used in the past, together with other diagnostic characters, towards the erection of several new genera of Trichiini. In the case of *Stegopterus*, as there are no other characters exclusive to the species that have the mesotibiae thus modified, it is useful towards the separation of the genus into two species groups, as detailed in the dichotomous key presented here below. Integuments, metallic hue colours, and the presence or absence of setae were not utilized in distinguishing species within the key for the males. This is because many of the holotypes are old, and their colours and setation may not have retained their original appearance. Nonetheless, the holotype description offers details regarding these characteristics.

Key to males of *Stegopterus*

The identification key was compiled only for males, as the females of ten out of fourteen species remain unknown.

1 Mesotibia strongly bent ventrally, with apex widened... **Species group *vittatus***
– Mesotibia simply curved, with apex not modified.... **Species group *septus***

Species group *vittatus*

1 External margin of protibia bidentate.....**2**
– External margin of protibia tridentate, with third tooth occasionally strongly reduced.....**3**
2 Anterior corner of clypeus shortly rounded (about 33% of clypeus length); lateral margin mildly rebordered and narrow towards base. Antennal club much longer than clypeus length (> 1.7 times).....***S. paardebergi* sp. nov.**
– Anterior corner of clypeus rounded (about 40–55% of clypeus length); lateral margin strongly rebordered and slightly narrowing towards base; antennal club as long as clypeus ....***S. suturalis* (Gory & Percheron, 1833)**
3 Antennal club shorter than clypeus **4**
– Antennal club 1.2–1.4 times longer than clypeus.....**6**
4 Protibial two distal teeth closer to each other than to third tooth **5**
– Protibial teeth equally spaced .....***S. vittatus* (Fabricius, 1775)**
5 Clypeus covered with thick, rounded punctures; apical margin of elytra with some rounded, scattered punctures; pygidial surface imbricate.....
..... ***S. kromrivieri* sp. nov.**
– Clypeus colliculate; apical margin of elytra shagreened; pygidial surface covered with scattered, round punctures .....***S. hexrivieri* sp. nov.**
6 Anterior margin of clypeus emarginate; with corner strongly rounded **7**
– Anterior margin of clypeus slightly retuse, with corner simply rounded....**8**
7 Clypeal lateral margin reborded and narrowing towards apex; pygidial surface imbricate; protibia externally tridentate, with distal two teeth closer to each other than to third tooth..... ***S. agulhas* sp. nov.**
– Clypeal lateral margin strongly reborded and narrowing slightly towards base; pygidial surface covered with round, scattered punctures; protibia tridentate, with all teeth equally spaced .....***S. endroedyi* sp. nov.**
8 Clypeal lateral margin strongly reborded and narrowing slightly towards base; metatibial lower spur slightly shorter and subequal to the upper.....
..... ***S. pallidulus* sp. nov.**
– Clypeal lateral margin reborded and narrowing towards apex; metatibial lower spur much shorter than upper.....***S. cochraneae* sp. nov.**

Species group *septus*

1 Elytral striae weakly marked.....**2**
– Elytral striae clearly visible.....**3**
2 Protibia externally tridentate, with all teeth equally spaced; metatibial lower spur much shorter than upper (about 30% of length).....
.....***S. septus* Burmeister & Schaum, 1840**
– Protibia externally tridentate, but distal teeth closer to each other than to proximal tooth; metatibial lower spur shorter than upper (about 73% of length) ..... ***S. lamellus* sp. nov.**
3 Clypeal lateral margin faintly reborded and semicircular in shape, antennal club about 2.1 times longer than clypeus; protibia bidentate .....
.....***S. rotundiceps* sp. nov.**
– Clypeal lateral margin moderately to strongly reborded, narrowing towards base; protibia tridentate.....**4**

4 Clypeal lateral margin strongly reborded and narrowing slightly towards base; protibia externally tridentate, with all three teeth equally spaced..... ..... ***S. fuscus* sp. nov.**

– Clypeal lateral margin reborded and narrowing towards base; protibia externally tridentate, with distal teeth closer to each other than to proximal tooth .....***S. langebergicus* sp. nov.**

Until now the genus *Stegopterus* comprised only three confirmed species: *S. vittatus* (Fabricius, 1775), *S. suturalis* (Gory & Percheron, 1833) and *S. septus* Burmeister & Schaum, 1840, all endemic to the Western Cape Province of South Africa. The new investigations described in this work have now revealed that the number of species in this genus is actually 15, one of which regarded as *incertae sedis* (see below the updated species list). What is most interesting is that the genus seems to be restricted to the region between the South and West coasts and the Cape Fold Mountains (CFM) of the Western Cape Province of South Africa. This is a pattern very reminiscent of the typical biogeography of other groups of insects that have undergone radiation linked to the Cape Floristic Region (CFR), one of the main regional centres of endemism on the African continent and represented mainly by the Fynbos Biome (Cowling et al. 2009; Manning and Goldblatt 2012). Several notable examples of beetles include flightless keratin beetles (Trogidae, Strümpher et al. 2016), monkey beetles (Hopliini, Colville 2009), Colophon stag beetles (Lucanidae, Endrödy-Younga 1988; Switala et al. 2014), jewel beetles (Julodini, Gussmann and Holm 2004), as well as the genera *Trichostetha* and *Odontorrhina* within the Cetoniinae subfamily (Holm and Marais 1992; Perissinotto 2012; Perissinotto et al. 2014), along with several examples from other groups.

By World standards, the CFR is an extraordinary phytogeographic feature that exhibits a number of vascular plant species in excess of 9000 over a surface area of approximately 91000 Km^2, with just over 68% of them regarded as endemic (Manning and Goldblatt 2012). In the more recent concept of a Greater Cape Floristic Region (GFCR), comprising fynbos, renosterveld, thicket, succulent karoo, and pockets of afrotemperate forest vegetation, this plant richness would actually escalate to over 11000 species, with a level of endemism at 77.9% (Colville et al. 2014). Of particular importance is that this vegetation, like its associated insects, is taxonomically dominated by a small number of speciose, largely endemic clades, which are usually absent or unimportant in other regions. For instance, the GFCR "contains > 85% of the South African monkey beetle fauna (>500 species), and ~50% of the World's fauna" (Colville 2009). In the case of *Stegopterus*, this region hosts the entire diversity of the genus as currently known since no confirmed records of any species have thus far been obtained from any other region in South Africa or anywhere else on the continent.

There are currently no serious conservation issues relating to the whole genus, as most species are high-altitude species dwelling in areas largely falling under the umbrella of the Cape Floral Region Protected Areas within the UNESCO World Heritage Convention (2004, https://whc.unesco.org/en/list/1007/). However, in mid- and lowland areas of the Western Cape there is an ongoing transformation of land use, particularly in the Cape Wineland District and in the areas under deciduous fruit cultivation, that may cause a

threat to some of the *Stegopterus* species, including newly described ones, such as *S. paardebergi* sp. nov., *S. kromrivieri* sp. nov. and *S. hexrivieri* sp. nov. As always, more research is needed to fully understand the extent of the distribution of the species.

Among the key factors responsible for this focal radiation of insect groups in the region are obviously issues of coevolution with host plants, pollination and adaptations for exploiting the diverse floral resources (Colville et al. 2014). These, combined with a high environmental heterogeneity and recent climatic stability would have provided the right conditions to promote high diversification and low extinction rates in the region (Cowling et al. 2009). Long-term climatic changes, though, may have represented an important driving factor behind *Stegopterus* evolution, in a similar manner to that explained for the *Colophon* stag beetles, for instance (Endrödy-Younga 1988; Switala et al. 2014; Samways et al. 2024). The two genera share a biogeographic distribution restricted mainly to the CFM, comprising a double range of eastern mountains parallel to the Indian Ocean coast and a single western mountain range running parallel to the Atlantic coast. These ranges trap moisture moving inland from the oceans and thus exert a major impact on the local climate, leading to wet southern slopes and arid northern plains (Switala et al. 2014). As during the Miocene, in particular, there was a gradual increase in aridity and temperatures, the low-lying areas would have become uninhabitable, forcing a number of species, including *Colophon* and *Stegopterus* members to move to higher altitudes, leading to their radiation by isolation of populations near the various CFM summits. This process is usually referred to as climatically driven allopatric speciation (Endrödy-Younga 1988; Switala et al. 2014). A substantial difference between the dynamics of the two genera lies in the fact that while *Colophon* is apterous and currently has no representatives in the coastal plain, *Stegopterus* species are all capable of flying and have maintained representatives in the low-lying areas.

Conclusions

After Péringuey's (1907) revision of the South African Trichiini it took eighty years for the subject to be taken up again by A. V. Evans (1987). Subsequently, starting in 1997, the first author of the current study began to devote various works to further exploring the diversity of the South African Trichiini fauna. Some of the key findings have led to the description of 31 new species, thereby more than doubling the total number previously known (Ricchiardi 1997, 1998; Ricchiardi et al. 1999; Ricchiardi 2000; Ricchiardi et al. 2004, 2008; Ricchiardi and Perissinotto 2013, 2014; Ricchiardi 2015, 2017; Ricchiardi et al. 2017). This work is, therefore, the most recent in a large series and represents a further major addition to the ever-increasing knowledge of the South African Trichiini.

Updated species list

Species group *vittatus*
Stegopterus agulhas sp. nov.
cochraneae sp. nov.

endroedyi sp. nov.
hexrivieri sp. nov.
kromrivieri sp. nov.
paardebergi sp. nov.
pallidulus sp. nov.
suturalis (Gory & Percheron, 1833)
vittatus (Fabricius, 1775)
Species group *septus*
fuscus sp. nov.
lamellus sp. nov.
langebergicus sp. nov.
rotundiceps sp. nov.
septus Burmeister & Schaum, 1840

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Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

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Author contributions

ER conceptualised the project with input from RP and WS. ER and WS identified, described and revised the species. ER wrote the first draft of the manuscript. RP and WS reviewed, commented and made additions to the final draft. ER and WS were responsible for the production of images.

Author ORCIDs

Renzo Perissinotto https://orcid.org/0000-0002-9224-3573
Werner Strümpher https://orcid.org/0000-0002-7047-2666

Data availability

All of the data that support the findings of this study are available in the main text.

References

Allsopp PG, Schoolmeesters P (2024) All genera of the world: Subfamilies Dynastinae, Rutelinae and Cetoniinae (Animalia: Arthropoda: Insecta: Coleoptera: Scarabaeidae). Megataxa 012(1): 001–103. https://mapress.com/mt/article/view/megataxa.12.1.1

Burmeister HCC (1842) Handbuch der Entomologie. Dritter Band. Coleoptera Lamellicornia Melitophila. Theod. Chr. Friedr. Enslin, Berlin, xx + 826 pp. + 1 pp.

Burmeister H, Schaum H (1840) Kritische Revision der Lamellicornia Melitophila. Zeitschrift für die Entomologie 2: 353–420.

Colville JF (2009) Understanding the evolutionary radiation of the mega-diverse Monkey Beetle fauna (Scarabaeidae: Hopliini) of South Africa. Frontiers of Biogeography 1(2): 56–60. https://doi.org/10.21425/F5FBG12267

Colville JF, Potts AJ, Bradshaw PL, Measey GJ, Snijman D, Picker MD, Proches S, Bowie RCK, Manning JC (2014) Chapter 4, Floristic and faunal Cape biochoria: do they exist? In: Allsopp N Colville JF Verboom GA (Eds) Fynbos: Ecology, Evolution, and Conservation of a Megadiverse Region. Oxford University Press, 73–92. https://doi.org/10.1093/acprof:oso/9780199679584.003.0004

Cowling RM, Proches S, Partridge TC (2009) Explaining the uniqueness of the Cape flora: Incorporating geomorphic evolution as a factor for explaining its diversification. Molecular Phylogenetics and Evolution 51(1): 64–74. https://doi.org/10.1016/j.ympev.2008.05.034

Endrödy-Younga S (1988) Evidence for the low-altitude origin of the Cape Mountain Biome derived from the systematic revision of the genus *Colophon* Gray (Coleoptera, Lucanidae). Annals of the South African Museum 96: 360–423.

Evans A (1987) A new species of the genus *Brachagenius* with notes on the synonymy of *Elpidus hopei*. Journal of the Entomological Society of Southern Africa 50(2): 351–356. https://journals.co.za/doi/pdf/10.10520/AJA00128789_4304

Gory H, Percheron A (1833) Monographie des Cétoines et genres voisins, formant, dans les familles naturelles de Latreille, la division des Scarabées mélitophiles. J.-B. Baillière, Paris, 406 pp. [77 pls] https://doi.org/10.5962/bhl.title.8957

Gussmann S, Holm E (2004) The African Jewel beetles (Buprestidae: Julodinae). Taita Publishers, Hradec Králové, 397 pp.

Harold E (1869) Catalogus Coleopterorum hucusque descriptorum synonymicus et systematcus. Tom. IV. Scarabaeidae. Gummi, Monachii, Germany, 979–1346. https://www.biodiversitylibrary.org/item/37342#page/1/mode/1up

Holm E, Marais E (1992) Fruit Chafers of Southern Africa (Scarabaeidae: Cetoniini). Ekogilde, Pretoria, 326 pp.

International Commission on Zoological Nomenclature (2006) Opinion 2162 (Case 3314). *Stegopterus* Burmeister & Schaum, 1840 and *Trichiotinus* Casey, 1915 (Insecta, Coleoptera, Scarabaeidae): Conserved. Bulletin of Zoological Nomenclature 63: 278–279.

Kirby W (1827) A description of some new genera and species of petalocerous Coleoptera. Zoological Journal 3: 145–158.

Krajčik M (1999) Cetoniidae of the World. Catalogue - Part II. Typos Studio, Most, Czech Republic, 72 pp.

Krikken J (1984) A new key to the suprageneric taxa in the beetle family Cetoniidae with annotated lists of the known genera. Zoölogische Verhandelingen 210: 1–75.

Lacordaire T (1856) Histoire naturelle des insectes. Genera des coléoptères, ou exposé méthodique et critique detous les genres proposés jusqu'ici dans cet ordre d'insectes.

Tome troisième contenant les familles des pectinicornes et lamellicornes. Librairie encyclopédique de Robet, Paris, 594 pp.

Manning J, Goldblatt P (2012) Plants of the Greater Cape Floristic Region I: The Core Cape Flora, Strelitzia 29. South African National Biodiversity Institute, Pretoria, 853 pp. https://www.sanbi.org/wp-content/uploads/2018/04/strelitzia-29-2012.pdf

Péringuey L (1888) Second contribution to the South African coleopterous fauna. Transactions of the South African Philosophical Society 4(2): 67–194. https://doi.org/10.1080/21560382.1884.9526202

Péringuey L (1907) Descriptive catalogue of the Coleoptera of South Africa (Lucanidae and Scarabaeidae). Transactions of the South African Philosophical Society 13: 1–546. https://doi.org/10.1080/21560382.1904.9525994

Perissinotto R (2012) Description of a new species and a new subspecies of *Odontorrhina* Burmeister, 1842 (Scarabaeidae, Cetoniinae), with ecological notes on the genus. African Invertebrates 53(2): 733–744. https://doi.org/10.5733/afin.053.0217

Perissinotto R, Šípek P, Ball JB (2014) Description of adult and third instar larva of *Trichostetha curlei* sp. n. (Coleoptera, Scarabaeidae, Cetoniinae) from the Cape region of South Africa. ZooKeys 428: 41–56. https://doi.org/10.3897/zookeys.428.7855

Ricchiardi E (1997) Notes on South African Trichiini. On the genus *Eriopeltastes* Burmeister & Schaum, 1840 (= *Diploeida* Péringuey, 1907), with description of three new species (Coleoptera: Cetoniidae: Trichiinae). Elytron 11: 121–132.

Ricchiardi E (1998) Notes for the revision of the genus *Stripsipher* Gory & Percheron, 1833, with descriptions of four new species (Coleoptera, Cetoniidae, Trichiinae, Trichiini). Mitteilungen der Münchner Entomologischen Gesellschaft 88: 45–64.

Ricchiardi E (2000) *Camapterus*, a new brachypterous Trichiini genus from South Africa Elytron 14: 201–206.

Ricchiardi E (2015) Description of a new monospecific genus of South African Trichiina, with a key to the related genera. European Journal of Taxonomy 159(159): 1–6. https://doi.org/10.5852/ejt.2015.159

Ricchiardi E (2017) Description of a new species of *Eriopeltastes* Burmeister & Schaum, 1840 from Swaziland. Cetoniimania 12: 13–17.

Ricchiardi E, Perissinotto R (2013) Description and ecology of a new species of *Eriopeltastes* Burmeister & Schaum (1840) (Coleoptera: Scarabaeidae: Cetoniinae; Trichiini), from KwaZulu-Natal, South Africa. Zootaxa 3630(2): 379–384. https://doi.org/10.11646/zootaxa.3630.2.12

Ricchiardi E, Perissinotto R (2014) New species of *Eriopeltastes* Burmeister & Schaum, 1840 (Coleoptera, Scarabaeidae, Cetoniinae, Trichiini) from South Africa. ZooKeys 422: 103–111. https://doi.org/10.3897/zookeys.422.7830

Ricchiardi E, Perissinotto R, Clennell L (1999) Description of three new species and the brachypterous females of the genus *Eriopeltastes* Burmeister & Schaum, 1840 (Coleoptera: Cetoniidae: Trichiinae). Elytron 13: 133–147.

Ricchiardi E, Perissinotto R, Clennell L (2004) *Parapeltastes*, a new subgenus of *Eriopeltastes* Burmeister & Schaum, 1840 from South Africa (Coleoptera Cetoniidae Trichiinae). Lambillionea CIV(2): 223–229.

Ricchiardi E, Perissinotto R, Clennell L (2008) Taxonomic revision of the South African genus *Stripsipher* Gory & Percheron, 1833, with descriptions of four new species (Coleoptera, Cetoniidae, Trichiinae). Bollettino della Società Entomologica Italiana 140(3): 155–178.

Ricchiardi E, Perissinotto R, Clennell L (2017) *Breviclypeus*, a new South African Trichiina genus. Fragmenta Entomologica 49(2): 125–132. https://doi.org/10.4081/fe.2017.253

Samways MJ, Pryke JS, Gaigher R, Deacon C (2024) Eco-evolutionary origins and diversification in a megadiverse hotspot: Arthropods in the Greater Cape Floristic Region. Ecology and Evolution 14(8, e70195): 1–20. https://doi.org/10.1002/ece3.70195

Schaum HR (1844) Observationes critiques sur la famille des Lamellicornes mélitophiles. Annales de la Société Entomologique de France 2(2): 333–426.

Schein H (1960) Coleoptera (Scarabaeidae): Cetoniinae and Trichiinae. In: Hanstrom B, Brinck P, Rudebeck G (Eds) South African Animal Life Vol. 7. Almquist & Wiksell, Uppsala, 83–112.

Schenkling S (1922) Pars 75. Scarabaeidae: Trichiinae, Valginae. In: Schenkling S (Ed.) Coleopterorum Catalogus. W. Junk, Berlin, 1–58. https://doi.org/10.1007/978-94-011-9697-0_1

Smith ABT (2004) Clarification on the nomenclatural status of six genus-group names in the tribe Trichiini (Coleoptera: Scarabaeidae: Cetoniinae). Coleopterists Bulletin 58(2): 285–291. https://doi.org/10.1649/704

Smith ABT (2005) Case 3314: *Stegopterus* Burmeister & Schaum, 1840 and *Trichiotinus* Casey, 1915 (Insecta, Coleoptera, Scarabaeidae): proposed conservation. Bulletin of Zoological Nomenclature 62(2): 75–78.

Strümpher WP, Villet MH, Sole CL, Scholtz CH (2016) Allopatric speciation in the flightless *Phoberus capensis* (Coleoptera: Trogidae) group, with description of two new species. Insect Systematics & Evolution 47(2): 149–179. https://doi.org/10.1163/1876312X-47022138

Switala AK, Sole CL, Scholtz CH (2014) Phylogeny, historical biogeography and divergence time estimates of the genus *Colophon* Gray (Coleoptera: Lucanidae). Invertebrate Systematics 28(3): 326–336. https://doi.org/10.1071/IS13054